THE IRON TRADE REVIEW

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Plant Activity is Increasing

At a Moderate Rate—Mills Determined Not to Fill Order Books for Future Delivery at Recent Low Prices

Conditions continue gradually to improve. The recent advance in shapes, plates and bars of $1 per ton for delivery after this month is an indication of the determination of the mills not to fill their order books on forward business at the recent very low prices. It is not expected that there will be heavy buying at the new quotations, but specifications on contracts are coming in satisfactorily. Further advance in wire products seems probable. Plant operations are slowly increasing. There is considerable more activity in the Connellsville coke regions, where 2,500 ovens have been placed on the active list since Jan. 1 by the Frick company.

The Steel Corporation's operations are now at 55 per cent of capacity, compared with 50 per cent last week. Its unfilled orders will show an increase of more than 200,000 tons for the month. Its export business is now as heavy as it was before war was declared.

Railroad Buying

Rail orders for January amount to about 275,000 tons, including 10,000 tons for export. This total is disappointing, and car orders are also light, but the rail market is by no means lifeless, and it is expected that a considerable tonnage will soon be placed. Careful investigation by THE IRON TRADE REVIEW indicates that railroad buying up to April 1 will be moderate, but that after that date orders will come in much more freely for rails, cars, machine tools and shop equipment.

Machinery

A decided increase in activity in the machinery market has taken place in the east and a large amount of new business is pending. While a considerable part of the new orders can be attributed to demand for war purposes, domestic demand shows encouraging improvement. Machine tool manufacturers in Cincinnati have just completed one of the busiest months in the history of the business in that city. At Pittsburgh, improvement in the machinery market last month gives reason for the hope that much better conditions will prevail during the next few months.

Plates

Plate mills in the Pittsburgh district are operating at a larger percentage of capacity than for some time, and orders for plates for ships recently contracted for are bringing good tonnages to Cambria and other mills, but all mills in the central west are not enjoying increased activity and the Otis Steel Co. has decided to close its new Cleveland plant until business improves.

Sheets

Owing to the strong demand for spelter from foreign countries, due to the cessation of operation of Belgian smelters, and increased demand from domestic manufacturers of brass products who have booked large orders for export, prices of spelter have been advancing until they are now higher than at any time in 30 years, and as spelter is extensively used in the manufacture of galvanized sheets, prices for that kind of sheets have advanced and mills are willing to take orders for prompt delivery only.

Pig Iron

Production of coke and anthracite pig iron, which in December was the smallest of any month since September, 1908, was increased in January to 1,591,024 tons, a gain of 95,699 tons. The average daily production for January was 51,323 tons, a gain of 3,087 tons over December.

Many Tool Builders Very Busy

Continuation of Tremendous Volume of War Orders Buoys Up Machinery Trade—Domestic Business Also Better

THE MONTH of January witnessed a large volume of buying of machine tools. While this demand involved mostly such tools as automatics, milling machines and turret and engine lathes, it also was reflected to a considerable extent in other lines of machinery. As a result, a great many manufacturers are well sold ahead and are working their plants overtime. For instance, one manufacturer of turret lathes is running his shop till 9 o'clock every night, and is advertising extensively for workmen in order to put on a night shift; a manufacturer of milling machines reports he is five to six weeks behind on his deliveries; an engine lathe manufacturer says he is 12 weeks behind. These are typical cases, illustrating the great degree of activity prevailing at many machine tool plants. Manufacturers of radial drills, sensitive drills, planers, and of numerous other kinds of machine tools also have taken considerable business of late, but are not nearly so busy as the makers of automatics, lathes and milling machines.

War is responsible for this show of activity. Toward the latter part of December there was a halt in the buying of machine tools for export to the belligerent countries, which business formed such a large total last fall. There also was less excitement over shrapnel contracts and orders for other war materials. In the first week in January, however, the export demand for machine tools by belligerents, as well as the demand for tools by such interests as had booked new orders for war materials, became very active. This demand kept up the first two weeks of January and, after a lull of a week, again became very active during the last week of the month.

War is Responsible

Among the concerns which purchased machine tools last month as a result of having booked war orders, the largest were the Pratt & Whitney Co., Hartford, Conn., the Remington Arms Co., Ilion, N. Y., and the Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn. These three concerns together placed orders for nearly 1,000 machine tools. Other large buyers of this character during January were the Nova Scotia Steel & Coal Co., the Washington Steel & Ordnance Co., the E. W. Bliss Co. and one other. Among the developments of the last week in January were the booking of a shrapnel contract by the Montreal plant of the American Locomotive Co., and the booking of a contract for making shells by a steel car manufacturer in Pennsylvania. These interests are expected to be large buyers within the next week or two.

Bethlehem to Sublet Contracts

Another development of interest to the machinery trade was the offer by the Bethlehem Steel Co. to sublet part of its shrapnel contract to such concerns as would make the shrapnel from Bethlehem forgings. At the close of January several other concerns in this country were figuring on shrapnel and shell contracts, with a likelihood that considerable additional business of this character would be placed. While war orders, therefore, continue to furnish the bulk of the business placed recently, a particularly satisfactory development was a perceptible improvement in the demand, in most of the leading centers of the country, from such domestic manufacturers as had not booked war orders. Machinery sellers in New York, Chicago, Cleveland, Detroit, St. Louis, Cincinnati and Pittsburgh, for instance, while finding the situation still far below normal, report that inquiries are coming in a little larger volume, and a more cheerful feeling is evident on the part of buyers. Most of this purely domestic business was in small lots, but there was manifested more of a disposition to issue and close on lists. For instance, the Massillon Rolling Mill Co., Massillon, O., purchased about $20,000 worth of machine tools in January; the Pangborn Corporation, Hagerstown, Md., issued a list of some 20 tools; the Splitdorf Electrical Co., Newark, N. J., bought a considerable quantity of tools, etc.

Technical Schools Buying

A feature of the market was the demand for machinery on the part of technical schools, especially in the east. Lists from such establishments are pending in Jersey City and Orange, N. J., in New York City, in Philadelphia, York, Pa., etc. There has been an improved demand for cranes and the month closed with a good deal of crane business pending, particularly that of the Bethlehem Steel Co., which purchased four cranes last week and still is in the market for 13. The Bethlehem company decided last month to resume its new construction program, which was abandoned at the outbreak of the war. During the month there was very little buying on the part of the railroads. In fact, the only purchases reported involved several tools for the Northern Pacific's locomotive repair shop at St. Paul, a driving wheel lathe for the Cincinnati, Hamilton & Dayton, a few tools for the Southern railroad, and about $7,000 worth of tools for the Wabash shops at Decatur. This lack of railroad buying naturally has a great indirect effect on the machine tool market, since there are many industries which are dependent for their prosperity in whole or in part on the railroads.

South America Inactive

During January there was an improvement in the export demand for machine tools from neutral European countries, especially from Italy, Spain and Sweden. There has been no improvement in demand from South American countries and one of the leading exporters cites as an example of conditions there, that its total machinery exports to one of the South American countries were almost exactly half in 1914 of what they were in 1913. This exporter does not expect any improvement in the South American demand until after the cessation of the war. Of interest during January were the efforts of concerns in various countries, particularly in South America, Australia and France, to secure agencies for American machine tools abroad.

Railways Buy Shop Equipment

Exhaustive Investigation Indicates Definite Improvement May Be Expected But Time Must Elapse Before Normal Conditions Are Restored

RAILWAY BUYING of machine tools and shop equipment has increased slightly since Jan. 1 and will show further moderate improvement during the first half of this year. This summarizes the results of an extensive investigation recently made by THE IRON TRADE REVIEW. The volume of railroad purchases is an exceedingly important matter in the machinery trade. For over a year the railroads have kept religiously out of the market, and, therefore, any definite indications of a more liberal policy will be very generally welcomed.

In conducting our investigation of this subject several hundred letters were written to builders of shop equipment used extensively by railroads and inquiries also were directed to the presidents of all the important railway systems in the United States. In addition, the subject was personally investigated by the correspondents of THE IRON TRADE REVIEW located at Chicago, Cincinnati, Pittsburgh, New York, etc.

Analyzing the returns received from the manufacturers we find that 44 per cent have tangible evidence of improved railroad buying since Jan. 1, while 56 per cent have not as yet noted any increase in business from this source. Turning to the railroads, 24 per cent of the systems communicated with advised that they expected to be able to be more liberal in their purchases of shop equipment; the replies from the remaining 76 per cent were practically all the same—namely that tool buying would be confined to current requirements. Six months ago, undoubtedly the number in the latter category would have been 95 instead of 76 per cent. The fact that nearly a quarter of the railroad executives will admit they can see light ahead is in itself encouraging. Extracts from a couple of the railroad letters are published herewith.

The replies received from the manufacturers are also interesting. A prominent Ohio builder of standard machine tools advised as follows: "We see an inclination on the part of the railroads to make inquiry, and have in our files quite a number of inquiries that were made last fall and this winter. But in view of the fact that outside of a few items the tonnage is very low, we feel that the railroads are going to still hold off if possible. They will naturally first buy rails and rolling stock, although there should be a revamping of machine tool equipment in nearly every instance.

"Domestic business is showing a little better. We believe with things fundamentally right and the farmer getting big money for his grain, the cotton situation improving, there will be a better feeling and condition arrived at, although we do not look for it to be of a boom nature."

A prominent eastern machine tool agency with intimate railroad connections writes: "The prospects for railroad business this spring seem fairly good, but we doubt if there will be very much purchased inside of three or four months. We have not received any orders from railroads that amount to anything within the last six or eight weeks. While the railroad people have been granted an increase in freight rates you must not overlook the fact that they have to arrange for finances before they can take up the matter of purchases."

Good News From Santa Fe

E. P. Ripley, president Atchison, Topeka & Santa Fe Railway System, writes:

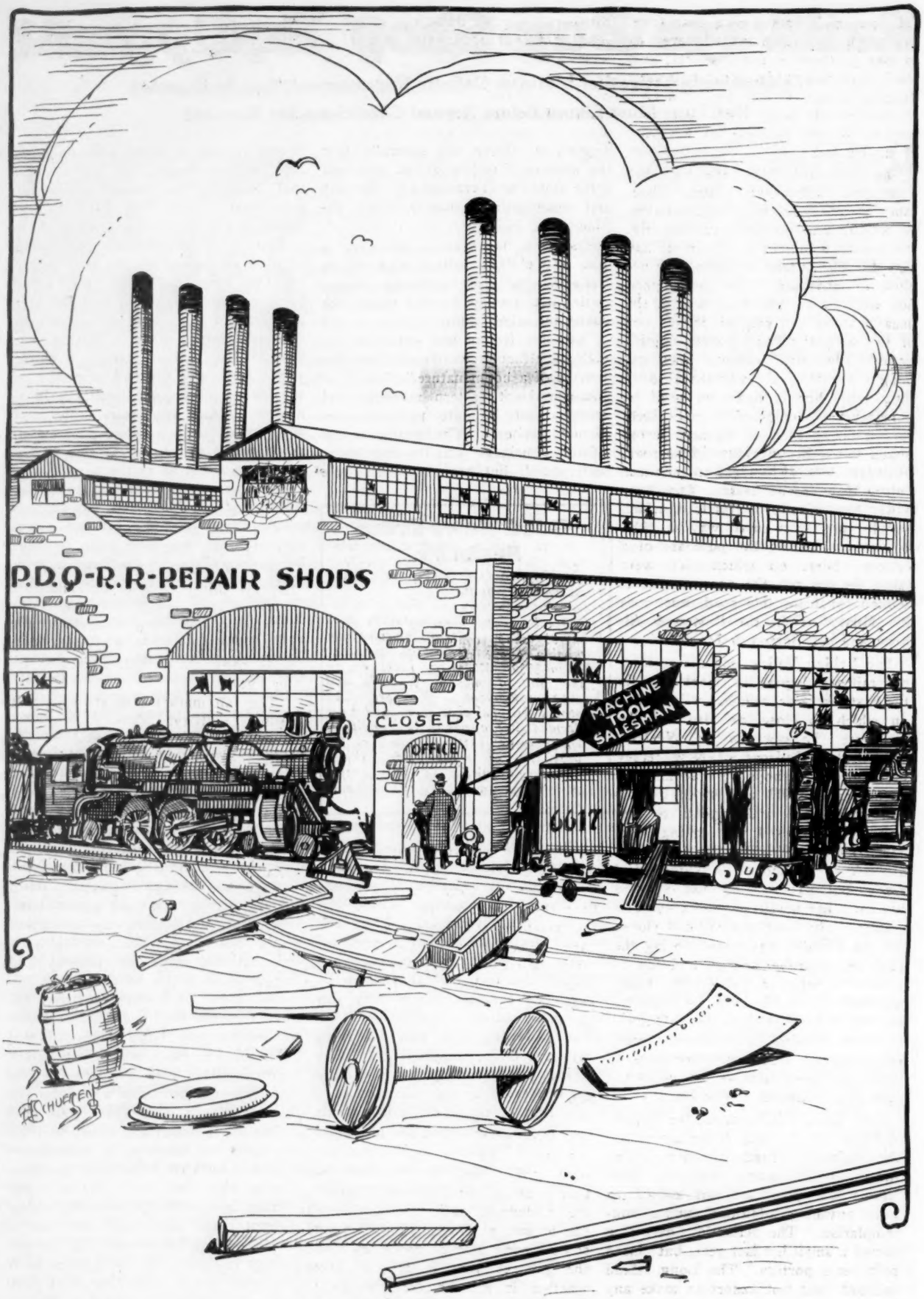
"Our buying of machine tools and general shop equipment will be probably about normal in volume during 1915. *We have planned no substantial increase in such equipment, but have given no orders for curtailment, so that our renewals will be on a normal basis. We are well equipped to handle our present volume of traffic and shall not be planning to expand until there is indication of an increase of traffic."*

The following was received from a southern Ohio manufacturer: "Our machines are not bought in any very large quantities by the railroads even in the best of times, so it is difficult for us to judge what are the prospects for railroad business in the coming spring. We note, however, that the inquiries and actual orders from other lines of trade are coming in greater volume, and all indications point to 1915 being in every respect a very satisfactory year. We know of two railroad inquiries for machine shop equipment that have been revived."

An eastern furnace builder states: "From reports of firms who do business with railroads, we are advised that business has shown some improvement in the last four to six weeks and from all appearances there is likely to be considerable purchasing of shop equipment in the near future by the railroads." On the other hand, another prominent manufacturer of a line of tools used extensively in railroad shops says: "During the year 1914 we did not receive a single order from any railroad company in the United States nor from the locomotive building companies. The railroad trade from a machine tool standpoint seems to be as inactive at the present moment as in the past."

A western manufacturer writes as follows: "We have not as yet received any orders for railroad material, although we have quite a number of machines on specification with different roads and car builders, which we believe will not be held up much longer. In general, our business is very good—in fact, we have more business on hand than ever before. Our orders are from the automobile trade and general shops, including farm implement manufacturers, boiler shops and street railway repair shops. In addition to the orders we have already booked, we have a very promising line of inquiries from various trades, and we shall be very much disappointed if we do not have an especially good year." Another westerner writes: "We have some inquiries that bear directly on railroad interests. Also, we are getting some very nice business, and, considering the condition of the trade as a whole, we feel very well satisfied with the present and expect much better of the future."

Our New York representative advises that the road which is expected to be the first large buyer of machine tools in the east this year is the Pennsylvania. This company in 1914 was expected to issue a list for its lines east on a scale about equivalent to the list it issued and closed in 1913; the latter list involved an expenditure of some $400,000. The only purchasing in 1914 was on a list of much smaller proportions, involving equipment for the lines west and now it is considered likely the big list expected in 1914 will be issued some time this spring. The New York Central, which has not issued a big list in several years, and which has bought



TIME TO GET BUSY—OPEN THE DOOR

only on small lists during that time, has given no intimation whatever as to any prospective requirements; this road, excepting a four-post hydraulic flanging press of 800 tons capacity, on which bids were taken last September, is not figuring on anything of importance.

The Seaboard Air Line and the Chesapeake & Ohio issued lists last year involving approximately $50,000 and $100,000, respectively; the Seaboard bought a part of its list, but the Chesapeake & Ohio did not close on anything. The tools specified will not be closed as lists in the usual manner but will be bought one or two at a time on separate requisitions. The Erie railroad has not bought anything of importance for a long time, but is badly in need of considerable equipment, particularly car wheel borers, a 60-inch throat punch and a 20-ton crane. This road, however, does not expect to purchase before July 1, at least. The New York, New Haven & Hartford, which bought only in a small way in 1914, is now considering the purchase of a cylinder borer on which bids were taken several months ago; no list is looked for from this road, nor from its affiliated roads, the Boston & Albany and the Boston & Maine.

The Lehigh Valley, one of the largest railroad buyers of machinery in the east last year, still has a few tools on which to close, as also has the Delaware, Lackawanna & Western. The Central Railroad of New Jersey modernized its shops by machine tool purchases in 1913 and 1914; it now has nothing up and expects to buy only in a scattered way during 1915. The Delaware & Hudson took bids a week or so ago on a 40-ton hand crane, but has nothing else up and has no other purchases under contemplation. The Southern railroad closed for considerable equipment during the past two months, and in addition to a 24-inch lathe and a 24-inch shaper on which it is figuring, is expected to put out other inquiries. Outside of having taken bids on a three-motor gantry crane, the Baltimore & Ohio has been inactive and contemplates no important purchases.

The Norfolk & Western, the Mobile & Ohio, the Norfolk & Southern and the Richmond, Fredericksburg & Potomac, which made scattered purchases last year, are not known to have anything additional under contemplation. The Atlantic Coast line issued a small list last year, but closed only on a portion. The Long Island railroad does not expect to make any important machinery purchases in 1915. The Pittsburgh, Shawmut & Northern needs considerable shop equipment, but there are no indications as to when the inquiries will be made. The Transcontinental Railway of Canada for some time has contemplated the purchase of $400,000 worth of machine tools for its Quebec shops and this list is expected out in the spring. The Union Pacific issued a list last year involving about $20,000 but never closed. The Southern Pacific took bids several months ago for some wood-working machinery but has not closed; this road also put out a large preliminary list of machine tools last year, but so far has not asked for formal bids.

Our southern Ohio correspondent states that the buying of machine tools and equipment by railroads from manufacturers in the Cincinnati district has been at a minimum for more than a year. Orders today are very scattered and usually are for one or two tools. Railroad officials almost as a unit state that they have no intentions of putting out large inquiries at present, as they are not running their shops full time and are not using the machines they already have on hand. The shops of the Mobile & Ohio railroad at Murphysboro, Ill., which closed down on Nov. 6 last year, will reopen on Feb. 2, employing 1,000 men.

From Chicago we learn that some observations of railway shops reveal that equipment is not up to the mark and that large purchases would be necessary to bring it to the point usually maintained. Urgent requests on the part of machine tool sellers as to what policy will be followed have been met on almost every hand by the statement that nothing definite can be said at present, and that while some buying may be necessary during the present year it is not known whether it will be done within the first half or later. The Northern Pacific, however, has purchased several tools within a month for its shops at St. Paul and the Wabash bought about $7,000 worth of tools for its Decatur, Ill., plant.

Car repair shops operated in western Pennsylvania and eastern Ohio are in operation, says our Pittsburgh representative, but none of them is running at capacity; they have been on reduced schedules ever since the nation-wide depression became pronounced. All of them, apparently, need some new machinery and equipment. When the orders for the tools wanted will be placed will depend largely upon the increase in revenues enjoyed by the railroads.

A Western Opinion

R. H. Aishton, vice president Chicago & North-Western Railway Co., has advised THE IRON TRADE REVIEW *as follows:*

"This company, in line with its general policy to maintain its customary high state of efficiency in operation, will make such purchases as may be absolutely necessary in the line of machinery, tools and shop equipment. We are, like others, hopeful that there will be a decided improvement in conditions which would justify increase in the purchases of railways for things actually required in the proper maintenance and operation of railroads."

Rail Orders

Of Fair Tonnage—Considerable Business Pending

New York, Feb. 2.—Total rail orders officially reported during the month of January aggregated approximately 275,000 tons, according to statistics compiled by THE IRON TRADE REVIEW. This includes about 10,000 tons for export. January usually is a month of heavy rail buying and the tonnage this year is of only fair proportions and considerably short of a full record. Most of the roads with a few exceptions, have bought on a scale considerably below that of former years.

The rail market still shows considerable activity. The Chicago & North-Western has placed 27,000 tons with the Illinois Steel Co. The Lackawanna Steel Co. will furnish practically all the Boston & Maine rails under the 15,000 inquiry recently reported as closed. The Erie railroad has distributed a round tonnage. The Maine Central is out for 8,500 tons. President Willard states that the Baltimore & Ohio will buy 25,000 to 30,000 tons in a few days, and western systems are negotiating. A new eastern inquiry for 2,500 girder rails and 1,000 tons of tee rails, is current.

Erie's Big Purchase

New York, Feb. 3. (By wire.)—The Erie's total rail purchases aggregate about 35,000 or practically double those of last year. The Carnegie Steel Co. gets 22,000, the Illinois Steel Co. 6,000, and the rest goes to an eastern independent. The Nickel Plate gives the Illinois Steel Co. 2,500 tons. Some old railroad orders which have been held up are now being released.

Chicago, Feb. 2.—The Chicago, Burlington & Quincy Railroad Co. is in the market for 1,700 cars, 1,500 box and stock cars and 200 gondolas.

THE OPEN HEARTH

A National Shame

For service at the Panama canal the government has purchased two gigantic floating cranes. They will be stationed at each end of the canal and will be visible from every passing ship. They were provided for handling guns on battleships, and other extraordinary weights and together represent an expenditure of nearly a million dollars. A fitting and harmonious monument, you say, to the American engineering skill and genius which have made the greatest of all waterways a reality.

Well, not quite.

For the cranes bear the well-known label, "Made in Germany".

Why?

See page 275 for the answer.

Loyal to His Employes

THE announcement made by Charles E. Adams, president of the Cleveland Hardware Co., in an address to the members of the Metal Trades Superintendents' and Foremen's Club of Cleveland, last Saturday evening, that his company expects to add a plan of unemployment insurance to the other forms of insurance now in force at the progressive plant of that concern marks a departure which will attract widespread interest among manufacturers of the country.

Mr. Adams is chairman of the citizens' committee of Cleveland which is conducting a campaign to raise $100,000 to provide employment on the public works of the city for worthy men who are now idle, and while engaged in this laudable task, Mr. Adams conceived the idea of providing unemployment insurance for the men in his own plant. He did a little figuring and became convinced that if every man should contribute a cent a day, while employed, to an unemployment fund, the amount would be ample to pay every unemployed man of the company $1 per day throughout the period of his unemployment. Details are to be worked out, but the plan promises to have wide popularity and to add greatly to the efficiency of employes. A man who is not worried about the danger of being thrown out of employment will do much better work than one who is constantly harassed by fear of being unable to provide for his family. The assurance that he will receive at least $1 a day, no matter what happens in the industrial world, will contribute greatly to his contentment.

Another important change which Mr. Adams expects to make is to require that in his company no employe shall be discharged if there is any work in any part of the plant that he can do. Foremen will not be required to keep working under them men who are not needed or are not efficient, but before a man is sent from the plant and an outsider employed, every possible effort will be made to give him employment within the plant. Such loyalty of an employer to his employes certainly will be reciprocated and result in greater permanency and better workmanship.

The Cleveland Hardware Co.'s plan of selling groceries to its employes, which has been in vogue for some time past, is proving highly successful, as are other methods of promoting the welfare of the workers. Hence it is not surprising that a man of the big brain and big heart of Mr. Adams is prepared to take new steps in the interest of the men who work with him and for him.

Shop Equipment for Railroads

STEADILY, but all too slowly it seems to some, business is resuming its normal stride. In the better prospects which appear to lie ahead, the builders of machine tools and shop equipment are anxious to know how they will fare. Previous to the outbreak of the war in Europe, the machine tool business was in a worse shape than it had been at any time for a quarter of a century. Not only were plants shut down and purchasers conspicuous by their absence, but almost every manufacturer was carrying double or triple his normal stock of finished machines. In Cincinnati, it now is openly admitted there were enough lathes and other standard tools on hand to supply the normal sales of the Cin-

THE OPEN HEARTH

cinnati manufacturers for two years. As is now well known, this situation, happily for the tool builders, was relieved by the war. Within 90 days, not only were the entire stocks of most machines cleaned up but orders accumulated to such an extent as to warrant the double shift operation of many plants. Throughout the fall and early winter months, however, while plants were busy on foreign business, domestic demand remained at a standstill.

This failure on the part of home consumers to show any signs of life has prevented the machinery builders from taking as much comfort as they otherwise would from the sudden and remarkable flood of orders from Europe. The European business is of a purely emergency character and in the very nature of things temporary. In the long run, the domestic demand is what is depended upon for meeting payrolls and paying dividends. In normal times a large share of this domestic business has come from the railroads. It is only natural, therefore, that the machinery trade is more than usually interested in the prospect for railroad buying during the next few months. This interest is heightened by a knowledge of the fact that, generally speaking, the railroads have made no purchases of shop equipment for a year or so and there is now some hope for a more liberal attitude on account of the favorable decision of the interstate commerce commission in the eastern trunk line freight rate case.

In order to meet the pressing need for information regarding the prospects for railroad purchases of machine tools and shop equipment, THE IRON TRADE REVIEW has conducted an exhaustive investigation, the results of which are presented on another page in this issue. While the replies received show that it is useless to count on any great volume of railroad purchasing before April 1, there is substantial ground for the belief that 1915 will witness a revival in railroad buying including not only track supplies and rolling stock, but machine tools and shop equipment as well. The long lines of bad order freight cars to be found at practically every division headquarters indicate that once traffic begins to move, the railroad shops will have their hands full and the need for enlarged facilities will become imperative.

Machine Tools on the Installment Plan

FOR SOME TIME the impression has been gaining ground that one reason for the inability of manufacturers of machine tools to dispose of their product satisfactorily in dull times, when many companies would like to rearrange and amplify their shop equipment, is found in a rigid adherence to practically cash terms of payment. In a time when money is scarce and credit difficult to obtain, even the strongest buyers hesitate to pay out large quantities of cash for shop equipment, although there is no doubt that considerable money can be saved by making improvements in dull times when interference with regular manufacturing operations would be at a minimum. It has been argued with considerable force that sales could be stimulated in such periods by giving the purchaser an opportunity to extend his payment over a considerable time. This device has been used with remarkable success by German manufacturers. Not long ago, since the war broke out in fact, a German firm sold a large shear to a manufacturer in Hoboken, N. J. It was a typical German machine of steel plate construction and the price was $3,250. The buyer was permitted to pay this on a basis of $500 down and $50 per month. The purchaser, therefore, has 55 months, or nearly five years, to pay for this particular piece of machinery. The American buyer, of course, agreed to pay interest on his notes covering the monthly payments.

Terms like this permit the machine to pay for itself and make no drain on the purse of the buyer. Similar methods have been successfully employed in this country by the manufacturers of printing machinery. By making arrangements with the purchaser for the acceptance of time drafts, the burden of credit can be shifted from the manufacturer to the banks under the new federal reserve act, thus sweeping away practically the only valid objection to the sale of shop equipment on the installment plan.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for February, 1914. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for Jan., 1915.	Average for Nov., 1914.	Average for Feb., 1914.
Bessemer pig iron, Pittsburgh..	$14.70	$14.70	$14.70	$15.09
Basic pig iron, Pittsburgh.....	13.45	13.45	13.45	14.09
No. 2 Fdy. pig iron, Pittsburgh	13.70	13.70	13.70	14.09
Northern No. 2 Fdy., Chgo....	13.00	13.00	13.00	14.25
Lake Superior Charcoal, Chgo..	15.75	15.75	15.75	15.50
Malleable, Bessemer, Chgo.....	13.00	13.00	13.00	14.25
Southern No. 2, Birmingham...	9.50	9.50	9.50	10.50
Southern Ohio No. 2, Ironton..	12.75	12.75	12.63	13.00
Basic, eastern Pa.....	13.50	13.50	13.50	14.00
No. 2X Virginia furnace.....	12.50	12.50	12.50	12.75
No. 2X Foundry, Philadelphia..	14.25	14.25	14.50	14.75
Ferro mang., Balti.....	68.00	68.00	66.00	36.00
Billets, Pbgh.	20.00	19.50	19.00	21.00
Sheet bars, Pbgh.....	20.50	20.00	19.62	22.00
Steel bars, Chicago.....	1.29	1.29	1.25	1.38
Steel bars, Pittsburgh.....	1.10	1.10	1.10	1.20
Iron bars, Philadelphia.....	1.15	1.12	1.17	1.27
Iron bars, Cleveland, local del'y.	1.15	1.15	1.20	1.30
Iron bars, Chgo. mill.....	1.00	.98	.98	1.20

	Today's prices.	Average for Jan., 1915.	Average for Nov., 1914.	Average for Feb., 1914.
Beams, Chicago	$1.29	$1.29	$1.25	$1.38
Beams, Pittsburgh	1.10	1.10	1.11	1.20
Beams, Philadelphia	1.25	1.20	1.25	1.35
Tank plates, Pittsburgh.....	1.10	1.10	1.09	1.20
Tank plates, Chicago.....	1.25	1.28	1.25	1.38
Tank plates, Philadelphia.....	1.25	1.20	1.25	1.35
Sheets, blk., No. 28, Pittsburgh	1.80	1.80	1.89	1.94
Sheets, blue an., No. 10, Pbgh..	1.30	1.30	1.39	1.40
Sheets, galv., No. 28, Pbgh....	3.00	2.77	2.86	2.94
Wire nails, Pittsburgh.....	1.55	1.51	1.59	1.59
Connellsvile fur. coke contr....	1.65	1.69	1.65	1.92
Connellsville fdy. coke, contr...	2.25	2.25	2.25	2.50
Heavy melting steel, Pbgh.....	11.50	11.55	10.06	12.37
Heavy melting steel, east'n Pa.	10.50	9.50	9.75	10.50
Heavy melting steel, Chgo.....	9.00	8.87	8.25	10.00
No. 1 wrought eastern Pa.....	12.00	11.50	11.50	13.25
No. 1 wrought, Chgo.....	8.75	8.80	7.50	9.44
Rerolling rails, Chgo.....	9.50	9.50	9.50	11.19
Car wheels, Chgo.....	10.00	10.00	10.00	11.75

(For Additional Prices See Page 304.)

Pig Iron Inquiry From Abroad

Aggregates Large Tonnage—Inquiry at Chicago is Active and Sales Fair—Buying Throughout the Country Generally Light

New York, Feb. 2.—Heavy inquiries from Italy for hematite or bessemer pig iron continue to attract the attention of eastern makers, especially, and the outlook is more favorable that some of this business may be booked on this side. Several eastern makers now are quoting. A further large inquiry received from Italian buyers the past few days calls for 50,000 to 100,000 tons of hematite for six months' delivery, raising the total tonnage now sought by that country to about 80,000 to 130,000. The feature of the domestic market is the heavy increase in shipping instructions now being received from consumers by the furnaces. In some cases, future quotas of contracts are being anticipated. This expanse of shipments at this time is attributed largely to the increased freight rates on pig iron in eastern territory, which are effective Feb. 23. Further tariffs giving the new advances are coming out. The Lehigh & New England railroad issued a special tariff, effective Feb. 1, to Central Railroad of New Jersey points, which shows a rate of 74 cents from Lehigh valley furnaces against 70 cents at present. This 74 cent rate will be put into effect Feb. 23 by all the roads running from that district. The new rate from the Schuylkill valley to tidewater is expected to be 95 cents against 90 cents at present. Rates from Virginia furnaces to eastern Pennsylvania, New Jersey, New York and New England territory, which recently were reduced, will not be affected by the general advances. Buying of iron has continued very light in the metropolitan and surrounding territory the past week. A Hyde Park, Mass., consumer has been figuring on 2,500 tons of foundry grades for first half. A new inquiry for 5,000 tons of basic for an eastern consumer for last half has been receiving attention. The Brooklyn navy yard is inquiring for 300 tons of foundry. A sale of 1,000 tons of foundry iron for New England shipment, is noted. Prices at tidewater range from $14.25 to $14.50 for No. 2X and in New England at $15 to $15.45, delivered, for No. 2X.

Market of Routine Character.

Philadelphia, Feb. 2.—Only routine transactions in pig iron, with a few exceptions, are being closed in this territory. Those consumers who regularly place contracts are well covered for the first quarter, leaving current business to the odd and end needs. These total only a light volume. Some satisfaction is felt by sellers in the receipt of instructions from consumers to hurry up shipments, some of which have come by wire, indicating a low stage of stocks in buyers' hands, which, it is believed is general. The J. L. Mott Iron Works, Trenton, which has been inquiring for 2,000 tons of foundry iron, is understood to have placed this business with eastern makers. The Carpenter Steel Co., Reading, has closed against an inquiry for 500 to 1,000 tons of low phosphorus basic for forward delivery. Car wheel manufacturers have been placing some lots of special grades and cast iron pipe makers continue to close or negotiate for odd tonnages. The Lenoir, Tenn., Car Works has not yet covered on its inquiry for 2,650 tons of foundry iron. Informal negotiations by several eastern basic consumers continue and in one case, may result in an early sale. Prices are quotably unchanged. The railroads are bringing out their new advanced tariffs on pig iron in eastern territory, effective Feb. 23. The new rate from the Lehigh valley to Philadelphia will be about 80 cents against 75 cents per ton at present. Other furnace points will show similar advances. The rate from the Jackson, O., district to Philadelphia and vicin-

(*For complete prices see page* 304.)

ity becomes $3.44 instead of $3.30. From Buffalo to Philadelphia and vicinity the advance is from $2.45 to $2.58 per ton.

Bessemer Shows Decline

Pittsburgh, Feb. 2.—The average price of bessemer and basic pig iron in January was $13.6375 and $12.50, valley, respectively, according to figures compiled by W. P. Snyder & Co. Averages are based on sales of 1,000 tons or more. Compared with averages for December, bessemer last month declined approximately 12 cents; basic showed no change in position. In January, 1914, bessemer pig iron sold at $0.3975 above the level established during the corresponding month this year. Last month's basic average was 17 cents above the average established in January, 1914. The Carnegie Steel Co. has blown in 10 furnaces since the close of last year and is now operating 32 stacks. The American Steel & Wire Co. blew in one Schoenberger furnace Feb. 1, and probably will light two more stacks before the end of this week. There is no increase in the number of active merchant stacks in this district. Specifications for pig iron are coming out at a fairly satisfactory rate, but new inquiry is light. Scattering lots of steel making and foundry grades continue to be sold at about prevailing quotations.

Fair Shipments.

Cleveland, Feb. 2.—Reports from furnaces in Detroit, Toledo, Cleveland and Buffalo, represented by Cleveland agencies, indicate that shipments during the past month were about equal to the make. This is not considered an unfavorable record for January and it is expected that this month shipments will exceed the output. Demand at present is very light, but the melt is slowly increasing.

Indiana Melter Buys.

Cincinnati, Feb. 1. — The Marion Gray Iron Foundry Co., Marion, Ind., has purchased 2,500 tons of northern foundry iron from a Toledo furnace, and this same company has also contracted for between 1,000 and 2,000 tons of southern foundry iron from a Birmingham, Ala., interest. This concern also still has an inquiry out for a good-sized lot of silvery iron. A large southern Ohio melter is inquiring for prices on from 3,000 to 6,000 tons of basic iron for the second quarter, but has not as yet made this inquiry a general one. These are the only items of interest that have developed in the pig iron market during the past week, as sales are still reported as being very light and widely scattered. Shipments on old contracts are going forward in a satisfactory manner and the melt in the Cincinnati territory during January shows an increase over that of any month during the last half of 1914. Prices are unchanged, southern No. 2 foundry being quoted at from $9.50 to $10, Birmingham basis, and southern Ohio No. 2 foundry at from $12.75 to $13, Ironton basis, both for first half delivery.

Iron Tonnage is Larger

Chicago, Feb. 2.—Inquiry remains active for foundry pig iron in the Chicago market and sales are being made steadily for moderate tonnages. While the market is fairly satisfactory as to tonnage, prices remain weak and no sign is apparent of better figures being realized.

Northern foundry No. 2 and malleable are selling at $13, Chicago furnace, and shading of this figure is not prevalent. Although rumors are heard from time to time of lower figures being quoted, investigation usually reveals the fact that off grades have been sold at a concession, which does not affect the price for No. 2 specification.

While makers for the most part are not anxious to quote beyond first half delivery, an inquiry developed recently for a tonnage between 4,000 and 5,000 tons of foundry iron for delivery during second, third and fourth quarter, on which considerable competition developed. Prices were quoted for the entire tonnage as low as those now current for first half delivery. It became apparent that furnaces located in four producing centers were willing to take the contract for the entire year at present schedules. The conclusion is that some makers of iron are willing to sell over the entire year at present prices for deliveries beginning during the second quarter. No sufficient inquiry has been received to indicate that any large proportion of buyers will consider their needs for second half at this time.

Southern iron still is obtainable at $9.50, Birmingham, although not all southern producers are willing to contract at this price and $10, Birmingham, is being asked by some important interests.

General Conditions Improve

Birmingham, Feb. 1.—While there is no actual improvement in the pig iron market, Birmingham makers are inclined to believe that conditions are better generally than a month or two ago. No. 2, Birmingham, is still quoted at $9.50 to $9.75, but only a few small orders are being booked and inquiry is limited and for small lots.

General business conditions of the south, iron interests believe, show improvement, slight, but noticeable, in the past two months, one prominent sales manager stating that the improvement was apparent in lumber, railroad, cotton and general conditions. If this general improvement continues with sufficient strength, Birmingham makers expect to sell some more iron for the first half; otherwise they will not.

It is stated that foundrymen bought to cover needs which they believed would be considerably below normal, during the buying movement which started the middle of last November and lasted until the holidays. Therefore, unless general business conditions improve to such an extent that these men find they have underbought, no business of importance is expected before buying for the second half begins, probably in May.

(For complete prices see page 304.)

Cast Iron Pipe

Shows Some Improvement in Prices—New Awards

New York, Feb. 2.—As a result of a continued good demand for cast iron pipe in eastern territory, prices are undergoing a slight, if not a uniform, betterment. Lettings bid upon in this district the past week have been higher on the average by a small margin. R. D. Wood & Co. is the low bidder on 2,143 tons of 6 to 14's for Hawthorne, N. J., at $20.23, delivered. No award yet has been made. The same shop took 225 tons 6 to 16's for Brookline, Mass., at $21.37, delivered; the United States Cast Iron Pipe & Foundry Co. received 560 tons of 16's for Troy, N. Y., at $20.20, delivered. Fitchburg, Mass., has taken revised bids on 325 tons of 6 to 20's. Fortland, Ore., will receive figures Feb. 10 on 4,250 tons of 6 to 30's. Private buying by the gas and water companies holds up well.

Many Municipal Lettings

Chicago, Feb. 2.—Cities continue to contract for cast iron pipe for their year's requirements and business is brisk in this line although the tonnages do not run as high as normal at this season. The United States Cast Iron Pipe & Foundry Co. has been awarded 1,700 tons at Sioux City, Ia., on which it was low bidder, and also has taken 1,400 tons of 12 to 20-inch pipe at Cincinnati, bids for which were opened Jan. 29. Bids are to be opened this week at Muscatine, Ia., on 300 tons, at Appleton, Wis., on 100 tons, and Redford, Mich., on 150 tons.

Scrap Higher in East

Block of Heavy Melting Sold to an Eastern Pennsylvania Consumer at Advance—Irregularities in Other Centers

Philadelphia, Feb. 1.—A block of 5,000 tons of heavy melting steel has been purchased by an eastern Pennsylvania consumer at $10.50, delivered, which represents an advance of 50 cents in this market. This advance in steel, as previously indicated, is the result of the higher prices paid for eastern material by consumers and brokers for Pittsburgh delivery. Brokers in the week paid in the east for shipment to Pittsburgh the equivalent of $11, delivered, eastern Pennsylvania. There appear to be only one or two buyers of steel in eastern Pennsylvania at a negotiable offer at present, as the best most consumers will pay is $10, delivered. The scrap market has been quieter in this center the past week and some grades are lower. Borings and turnings sold at $8, delivered, though $8.25 was offered for forward delivery. Several buyers in eastern Pennsylvania territory took lots of No. 1 railroad wrought at $12, delivered. A sale of 350 tons of wrought pipe to a dealer at $10, delivered, eastern Pennsylvania, was done. Several hundred tons of heavy cast sold at $12, delivered. High freights still block any export business in all material.

Scrap Weakens

Pittsburgh, Feb. 2.—The old materials market has reflected softness this week. Heavy melting steel, which sold as high as $12.25 in isolated instances, again is being offered at $11.50, and other grades are correspondingly weak. Consumers appear to have enough material in stock to meet first quarter needs, and the market probably will show irregularity the next few weeks.

Scrap Still Weak

Chicago, Feb. 2.—Continued weakness characterizes the scrap market in Chicago and some declines in rolling mill grades have been registered during the past week. After the slight buying bulge week before last, large consumers have been out of the market and dealers have moved comparatively little tonnage.

Railroads are offering considerable accumulations, the Chicago & North-Western issuing a list containing 3,800 tons, of which 1,600 tons are No. 1 wrought and 450 tons No. 1 cast; the Illinois Central offers 2,400 tons, the Grand Trunk 700 tons, the B. & O. 7,500 tons, including 2,500 tons of No. 1 rails and 1,000 tons of old car wheels.

Market Low.

Cincinnati, Feb. 1.—The scrap market continues to show no life and although the feeling is a little more optimistic, no definite results can be noticed. A slight demand still continues for No. 1 machine cast, because of the large number of machine tool castings being made in this city at the present time, but this is more than counterbalanced by the large surplus of other materials that dealers have on hand and the fact that this surplus is gradually increasing. Prices have shown a slight tendency to fluctuate recently, but have always swung back to the former level which has held for several months.

More Hopeful

Is Outlook for Shipments of Ferro, But Doubt Continues

New York, Feb. 2.—Fresh encouragement that the embargo on English ferro-manganese to this country may be raised sufficiently to permit some February shipments was given in further mail advices from abroad the past week, but cable messages just received impose some additional terms upon the buyers and these now are receiving the attention of the trade. Just what these terms stipulate has not been learned, but it is understood they are of considerable importance. At the same time, the outlook for some deliveries in February is considered more promising.

The mail advices of the past week conveyed information that the government authorities practically have reached the point of granting licenses to ship certain tonnages to specified consumers in this country under the written agreements recently furnished by the latter that they will not reexport the alloy or sell any steel products to the enemies of Great Britain except through London. It is stated, however, that the English authorities will not permit the shipment of more than the normal requirements of the various buyers as gaged by their past needs. No definite advice of sailings from England for arrival this month have been received.

More inquiry continues current in the market. A western buyer asks 500 to 1,000 tons for first half and an eastern Pennsylvania consumer 200 tons for prompt. A number of small lots for early delivery are out. An Australian consumer asks 800 tons and other export inquiries are before sellers. Because of the scarcity of prompt material, sales call for small amounts individually. Lots of 5 to 10 tons of ground ferro-manganese are being taken by foundries at 3½ to 4 cents per pound at the grinding plant. Few ton sales of lump have been made as high as $90, seaboard. The price on carloads for forward delivery remains nominally $68, seaboard, subject to the ability of the seller to make shipments.

Situation Brighter

Pittsburgh, Feb. 1.—Consumers of ferro-manganese are more hopeful about future shipments, believing that Great Britain soon will allow this material to be exported, under certain restrictions. The British government will prohibit any speculation, and will make consumers guarantee not to export this alloy nor use it in steel for shipment to countries hostile to Great Britain. Small tonnages of ferro-manganese for immediate shipment have sold at $75, seaboard, and above. Consumers have hesitated about negotiating for future needs because of the uncertainty.

Wire Advance

At Early Date Rumored—Specifications Are Satisfactory

Pittsburgh, Feb. 2.—Talk of an advance of $1 a ton for wire products is heard at this center, some predicting that new prices will be announced within a week or 10 days. Wire nails are now quoted at $1.55 a keg. The domestic situation shows slight improvement, prevailing quotations being maintained, so far as can be learned. Exports of wire material are lighter than they were several weeks ago, the result of increases in freight rates for ocean transportation.

Business Satisfactory.

Cleveland, Feb. 2. — Specifications against contracts have been coming in at a fair rate since the recent advance, but it is not expected that there will be another advance this week. It is recalled that last year, under the spur of advancing quotations, jobbers and manufacturers specified very heavily and that a few months later conditions in the wire market were very unsatisfactory. Hence the more moderate specifying at the present time is regarded as a better policy.

(*For complete prices see page* 304.)

Sheet Prices Withdrawn

Mills Not Willing to Quote on Galvanized Owing to High Price of Spelter—Cutting on Blue Annealed

Pittsburgh, Feb. 2.—Sheet manufacturers enjoyed increased activity last week. Specifications were general and involved rather heavy tonnages. Car builders are figuring more prominently in the market, and demand for export shipment has increased. Galvanized sheets, uncertain because of the spelter situation, are being held at from 3c to 3.05c for No. 28 gage. The American Sheet & Tin Plate Co. is refusing to sell at less than 3c, and only for immediate delivery. Black sheets and blue annealed continue to be listed at 1.80c and 1.30c, respectively, for base sizes.

Prices Withdrawn.

Cleveland, Feb. 2.—Manufacturers of galvanized sheets in this territory have withdrawn all prices, owing to the high price of spelter, and no business is being transacted at the present time. Competition in black and blue annealed sheets is keen and as low as 1.30c, Youngstown, is quoted on No. 10. Specifications on large quantities of black sheets for steel barrels for export are being received by the mills.

Sheet Situation Unchanged

Chicago, Feb. 2.—An utter deadlock continues to exist in the sheet market as far as galvanized are concerned and producers in this territory are refusing to make quotations. The market probably could be said to be 3.19c, Chicago mill, for No. 28 gage galvanized, but under present methods of contracting producers are unwilling to obligate themselves in view of the uncertainty of the spelter market. Spelter is nominally quoted at 7.50c to 8c, St. Louis, and apparently is not obtainable in large quantities even at that figure. With the possibility of the market weakening before actual deliveries are made, mills will not risk the resulting declines. No. 28 gage black sheets are unchanged at 1.99c to 2.04c, Chicago mill.

Galvanized Sheets Uncertain.

Cincinnati, Feb. 1.—The continued advance in spelter has caused galvanized sheets to become very uncertain and mills today are not giving out any definite quotations and are refusing to sell except for spot shipment. The tendency of prices is towards a higher level, but they may change from day to day, depending entirely upon developments in the spelter market. Black sheets are a little more steady, but are also a little uncertain and mills are likewise refusing to contract except for very short periods. They are quoted at from 2c to 2.05c, Cincinnati basis. Business continues fair and is coming from all parts of the territory. The Newport Rolling Mill Co., Newport, Ky., is today operating both of its plants in all departments and will continue to do so for an indefinite period.

Sheet Orders Sluggish.

Philadelphia, Feb. 1.—Specifications for sheets with eastern makers are backward and sufficient tonnage usually is lacking at the beginning of a week to make up a full week's rolling. The day-to-day orders, as a rule, make up this deficiency. The contract tonnage on the books is considerable. The Alan Wood Iron & Steel Co. has started four puddling mills at its Conshohocken works to replenish its stock of certain sizes of bars. A moderate tonnage of heavy sheets for vessels recently placed is before eastern makers. The range of prices quoted by eastern mills is from 1.50c to 1.55c, Philadelphia, or 1.35c to 1.40c, Pittsburgh, for No. 10 blue annealed.

Warehouses

Are Doing Slightly More Business—Galvanized Sheets Higher

Chicago, Feb. 2.—Warehouse business is holding steady and a normal increase due to the advancing season is being registered. From inquiries it is apparent that as soon as the building season opens, a strong demand for building material will be made and preparations are making to handle it.

The flutter in the sheet market caused by galvanized sheets being unobtainable from mills on new contracts has been reflected in the warehouse field by an immediate stiffening of prices to 3.55c, Chicago store, instead of the figures to which this price had been shaded for some time past. Storehouses here have an ample supply of sheets for ordinary demands and are well protected by contracts with mills, provided the makers are able to fill their contracts before their supply of spelter is exhausted.

Market More Quiet.

Cincinnati, Feb. 1.—Warehouse business has slowed down a little since the first of the month and today is very quiet. This is because many building operations in this territory have been stopped until spring. Dealers are looking for much better buying during the latter part of February, when spring contracts for buildings will be let and materials purchased. All warehouse prices here are steady and unchanged except those on sheets, which fluctuate with the market as quoted by rolling mills in this territory.

Sheet Prices Advanced.

Cleveland, Feb. 2. — The excited condition in the galvanized sheet market is reflected in an advance from 3.35 to 3.50c on No. 28 galvanized out of store. Cleveland warehouses report that their total sales for January were slightly larger than for December.

Pig Tin Affects Tin Plate

Pittsburgh, Feb. 2.—Tin plate mills are busy in western Pennsylvania and eastern Ohio. Excitement in the pig tin market has tended to stiffen the quotation for tin plate, more important mills refusing to shade $3.20, base. Mills are operating at about maximum capacity. Several attractive orders for export shipment have been placed recently.

Bolt Market Improving

Pittsburgh, Feb. 2.—The market for nuts, bolts and rivets has reflected moderate improvement the last two weeks. While demand is not heavy, yet makers say consumers appear to be more anxious to cover needs than they did six weeks ago. Quoted prices are more closely adhered to. Structural rivets are being held at 1.50c, but attractive tonnages are obtainable at about $1 a ton under that figure.

Iron and Steel Pipe

Pittsburgh, Feb. 2.—No large orders for steel pipe have been placed in this district since those awarded the National Tube Co., and no particularly attractive inquiries are pending, so far as can be ascertained. Discounts are reported to be firm. There is no change in the situation for iron pipe. Demand for boiler tubes remains light, and prices are low.

(*For complete prices see page* 304.)

Bar Prices Are Firm

With Fair Specifications in Most Centers, But New Buying is Very Light

Chicago, Feb. 2.—While the general tendency of the steel market is upward, the encouragement that comes from week to week is so slight as scarcely to be discernible and increase of contracts is not great. During the past week, the market apparently has stood still and bookings of bars have not been large. The market still is being maintained at 1.29c, Chicago mill, with one seller holding March deliveries at $1 per ton higher. Mills are busy at present turning out steel contracted at 1.24c, Chicago, or lower, and consumers are not anxious, apparently, to buy at a higher price until these orders have been filled.

Steel Bars Strengthen

Pittsburgh, Feb. 2.—Demand for steel bars in January was considerably heavier than in December. Specifications came out in fairly good volume, and some new buying was enjoyed. Bars are being held at 1.15c for March and 1.20c for second quarter delivery, but the 1.10c figure continues to be offered for this month's shipment. Iron bars are selling at rather wide ranges, but the 1.10c figure has not entirely disappeared.

Mill Orders Less Active.

Philadelphia, Feb. 1.—Specifications against steel bar contracts in this territory were in lighter volume the past week and there is but small new buying, so that the market is quiet. The Tennessee Coal, Iron & Railroad Co. took the bars and small shapes of the inquiry recently put out by the Lenoir City, Tenn., Car Works. An inquiry for 150 tons of angles, shapes and bars for a Norfolk consumer is out. On a recent inquiry for 1,200 tons of rivet rods in this district, a leading mill is reported to have first quoted 1.05c, Pittsburgh, but withdrew the price and substituted 1.10c, Pittsburgh. All the principal makers seem to be holding steadily at 1.25c, Philadelphia, or 1.10c, Pittsburgh.

Iron Bars Gain Strength

Chicago, Feb. 2.—Continued improvement is noted in the situation as to bar iron and the market now apparently rests on a solid foundation with a minimum of 1c, Chicago mill, with sales being made from that to 1.05c, Chicago. It appears that during the period of extreme low prices some consumers managed to obtain contracts which will last them at least through first quarter at 0.90c, Chicago mill, and are specifying on these for their present needs. Efforts by others not so well protected to obtain tonnage at prices under 1c, Chicago, are said to have been unavailing.

Mills in this vicinity are operating on better schedules and orders are coming in in excess of shipments, continually adding to the mill backlog.

Firm at Cleveland.

Cleveland, Feb. 2.—The bar market is firm at 1.10c for prompt delivery. The leading makers are asking 1.15c for March delivery and 1.20c for second quarter. On bars and other finished materials, specifications are satisfactory. Some plants are very busy and the general outlook is regarded as more favorable than for some time.

Hoops, Bands, Shafting

Pittsburgh, Feb. 2.—Hoops have hardened somewhat the last week or 10 days, and the 1.25c figure appears to represent the bottom of the market. Bands are being held at the prices asked for steel bars, namely, 1.10c for February, 1.15c for March and 1.20c for second quarter. Cold rolled shafting has been sold at 68 per cent off, but, with the bar steel quotation gradually stiffening, it is not improbable shafting will show strength in the near future.

More Plates for Ships

Cambria Steel Co. Closes With Maryland Steel Co. to Cover Requirements for Boats Recently Ordered

Pittsburgh, Feb. 2.—An increase in the number of orders for steel plates has enabled mills to extend operations to a moderate extent. In December, it will be recalled, mills were operating at from about 35 to 40 per cent; they produced from 45 to 50 per cent of capacity last month; this week many mills are operating at from 55 to 60 per cent, and indications are present schedules will be maintained throughout the month. The Carnegie Steel Co., Feb. 1, announced the following prices for plates, shapes and bars: 1.10c for February; 1.15c for March, and 1.20c for second quarter, adopting levels offered by the Republic Iron & Steel Co. a week previous. Advanced levels probably will be uniformly quoted before the end of the week.

Boat Steel is Placed

Philadelphia, Feb. 1.—The Cambria Steel Co. definitely closed in the week with the Maryland Steel Co. for 6,000 to 8,000 tons of plates to cover the requirements of recent shipbuilding contracts taken by the latter. The Maryland Steel Co. has received the award of a third freight and passenger steamship from the American-Hawaiian Steamship Co. to replace the Washingtonian of this line recently lost at sea. This makes a total of three vessels for this company just placed with the Sparrows Point yard. Negotiations for further shipbuilding work continue briskly. An award still is awaited on the three boats for W. R. Grace & Co. The J. W. Elwell interests are reported in the market for two vessels. The Carnegie Steel Co. received about 1,200 tons and the Jones & Laughlin Steel Co. 700 tons of steel for coal barges for the Navy department to be built at Mare Island. Bids are going in this week on 500 tons additional of caisson work for delivery at Cristobal, Panama canal. Some of the eastern plate mills are operating slightly better, principally as the result of recent marine requirements, but the improvement is small. The usual price for plates continues at 1.25c, Philadelphia, or 1.10c, Pittsburgh. Certain mills, however, shaded this delivered figure on round tonnages offered the past week.

Riverside Works Closed.

Cleveland, Feb. 2.—Owing to the lack of orders, the Otis Steel Co. has decided to close its new Riverside works in the Cuyahoga valley, until business revives. The plant comprises a 3-high 72-inch plate mill, three jobbing mills, one of the latter being the widest mill of its type in the country, and two cold mills. The plant makes light plates and sheets down to and including No. 18 gage. It was placed in operation last September with every facility for the production of not only common tank plates, but blue and box annealed,

(For complete prices see page 304.)

pickled, cold rolled and patent leveled sheets. But the plant was finished at a time when business was very poor and in spite of a fair amount of orders taken, it has been decided to suspend operations for at least three months. It is understood that contracts on hand will be filled by other mills. The Lakeside plant of the Otis Steel Co. is running at full capacity on plates. The Cleveland Steel Co. is extremely busy and was compelled to operate last Sunday. This was the first Sunday in many years on which the plant was in operation. The plate market in the Cleveland district is firmer and quotations below 1.10c, Pittsburgh, have been withdrawn. In spite of reports from Chicago to the contrary, it is asserted that nothing less than 1.05c, Pittsburgh, has been done by mills in this district.

Plates Still Weak

Chicago, Feb. 2.—Of all finished steel products plates appear to have the least strength. While they are nominally quoted at 1.29c, Chicago mill, tonnages are being disposed of at $1 per ton less and considerable competition is being met from the Cleveland district where a producer apparently is willing to take considerably less than 1.10c, Pittsburgh.

More Structural Awards

In Some Districts and Fewer in Others—Low Prices Made on Fabricating and Erecting

New York, Feb. 2.—A slight betterment of volume over preceding weeks is shown in the total structural awards of the past week in eastern territory, which in all districts, totaled about 5,000 tons. The change is so small while the new inquiry remains so restricted, however, that fabricators derive no encouragement from it. Extreme competition for fabricated work was present in some of the awards in this city, where prices of about $40 a ton, erected are said to have been as low as ever have been made on certain types of construction. It is evident that fabricators in these cases were able to figure upon a considerably less value for plain material than 1.26c, New York, or 1.10c, Pittsburgh. The situation on plain material is such that on any specific requirement of good size, it is apparent that 1.10c, Pittsburgh, can be shaded, especially with those mills located closest to this center. The Pennsylvania railroad interests have filed plans for a large printing building to be erected in the Pennsylvania terminal district, this city, which, according to the design, will call for 10,000 to 15,000 tons of steel. It is not certain, however, that the project will go ahead immediately.

Want Pennsy Work Divided.

Philadelphia, Feb. 1.—Doubt now is entertained whether the 19,000 ton requirement of bridge work of the Pennsylvania railroad for the year of 1915, will be placed in one block. Some of the larger fabricators are objecting to bidding upon the work as a single budget and want the opportunity to compete for portions of it as needed throughout the year. No action has been taken on this matter by the Pennsylvania railroad though the bids formally were closed some days ago. The Lenoir City, Tenn., Car Works has distributed the orders for 1,325 to 2,650 tons of car material, largely shapes, on which it took bids last week. A considerable part of the business went to the Tennessee Coal, Iron & Railroad Co., but some of it also was taken by a northern mill.

A Baltimore buyer is reported to have contracted for 500 tons of structurals for second quarter at below 1.15c, Pittsburgh. There is no improvement in the structural situation in this territory. Mill bookings are light. The fabricating shops are taking little work and have small tonnages to bid upon. Fabricating prices are severely low. A good tonnage of shapes undoubtedly would command some concession from 1.25c, Philadelphia, from nearby mills. This figure, or 1.10c, Pittsburgh, however, prevails on the run of the market sales.

Mill Contract Awarded.

Cleveland, Feb. 2.—Interest centers in the bids on the 7,500 tons of steel for the Clark avenue bridge, which will be received Feb. 23. On account of a number of important contracts recently let to shops outside of Cleveland, it is expected that considerable pressure will be brought to bear on city officials to award the 7,500 tons to a Cleveland shop. The contract for the Union Rolling Mill Co.'s structural mill, 500 tons, has been awarded to the Forest City Steel & Iron Co., the first Cleveland concern that has succeeded in taking a contract of any consequence recently. The Riter-Conley Mfg. Co., Pittsburgh, was awarded the Jewish hospital, 450 tons, at $33.20, delivered.

Structural Shapes Advanced

Pittsburgh, Feb. 2.—While fabricators in this district have not taken many large orders this week, demand for structural steel shows some improvement. The Pennsylvania Lines West has not placed contracts for about 20,000 tons of steel for work at Indianapolis, and the Chicago, Burlington & Quincy railroad still is figuring on 2,000 tons of channels. The Carnegie Steel Co. is asking 1.15c for shapes for March and 1.20c for second quarter shipment.

Structural Market Steady

Chicago, Feb. 2.—Preparations for spring work are going forward, resulting in a constant stream of contracts for shapes to go into various projects. The market is quotable at 1.29c, Chicago, although some weakness is maintained in cases where competition is severe. Among the contracts closed during the past week, is one at Seattle, Wash., involving 292 tons, which was divided between three concerns, indicating the keenness of competition. A movement has arisen on the Pacific coast which has for its object keeping all possible construction work in the hands of concerns located there and with this condition eastern companies find it almost impossible to obtain tonnage in that section.

Revised plans for the Boston store addition at State and Madison streets, Chicago, call for 17 stories instead of 12 stories as at first planned. Contract for the steel, which was given to the American Bridge Co., was with an option for 17 stories, which has been taken up.

CONTRACTS AWARDED.

Jewish hospital, Cleveland; 450 tons; to the Riter-Conley Mfg. Co., Pittsburgh.

Union Rolling Mill Co., Cleveland, 500 tons for structural mill, to the Forest City Steel & Iron Co., Cleveland, O.

Bridge over the Ohio river at Parkersburg, W. Va., 2,200 tons, awarded to the American Bridge Co. by Parkersburg Ohio Bridge Co.

City of Chicago, Wilson avenue water tunnel, Chicago, 738 tons, to Chicago Bridge & Iron Co.

Midland Warehouse Co., warehouse, Chicago, 400 tons, to North Works, Illinois Steel Co.

High school, El Paso, Tex., 300 tons, to El Paso Foundry & Machine Co.

Seattle Terminal Co. building, Seattle, Wash., 292 tons, to National Steel Construction Co., Vulcan Iron Works and N. & S. Foundry Co., Seattle, Wash.

Denver Union Terminal Ry. Co., Delgany street approach to Twentieth street viaduct,

(*For complete prices see page* 304.)

Denver, Colo., 152 tons, to Patterson-Burkhardt Co.

Store building for Arnold, Constable & Co., Forty-third street and Fifth avenue, New York City, 1,800 tons, awarded Levering & Gerrigues, and the steel will be furnished by the Lackawanna Steel Co.

Addition to the machine shop of Landis Machine Co., Waynesboro, Pa., 100 tons, awarded Belmont Iron Works.

Addition to Philadelphia Hospital for Contagious Diseases, Philadelphia, 225 tons, awarded McClintic-Marshall Co.

Office building for the Victor Talking Machine Co., Camden, N. J., 1,400 tons; general contract awarded Geo. A. Fuller Co.

Apartment house for Geo. Barker, at 13 West Fifty-fifth street, New York City, 325 tons, awarded to the Hay Foundry & Iron Works.

Department store for Smith & Murray, Springfield, Mass., 350 tons, awarded to the Walsh Steam Boiler Works.

Highway bridges, Concord, N. H., 770 tons, tentative awards of three structures made to the Berlin Construction Co. and of one to the Penn Bridge Co.

CONTRACTS PENDING.

High school at Newark, N. J., 210 tons, bids being taken.

Grandstand and other steel construction for new park of the Boston National League Baseball Club, Boston, plans to be issued about March 1.

Bridge work for the Chesapeake & Ohio Northern, between Portsmouth and Columbus, 3,600 tons, plans to be issued shortly.

Freight sheds for the Texas & Pacific railroad at New Orleans, tonnage indefinite, bids taken.

City market for Newark, N. J., 1,600 tons, revised bids being taken.

Hopper loft building at Thirtieth street and Broadway, New York City, 1,800 tons, bids taken.

Coke Ovens

Are Being Blown In Owing to Increased Blast Furnace Activity

Pittsburgh, Feb. 2.—The Connellsville coke market is quiet, so far as sales are concerned, but there has been a gradual resumption of activity in the coke region since the close of last year. The H. C. Frick Coke Co., a Corporation subsidiary, has blown in 2,500 additional ovens since Jan. 1, to provide for increased blast furnace capacity. There is no change in the price situation. The Connellsville *Courier*, for the week ending Jan. 23, says production was 214,210 tons, an increase of 7,360, compared with the week before.

New Contracts Scarce.

Cincinnati, Feb. 1.—The southern coke market continues to drag along as far as new sales are concerned. There is absolutely no demand for coke from any source, as foundries are still covered until next July, and no furnaces are contemplating blowing in. Those already in blast are well covered for several months. Shipments on old contracts are fairly satisfactory. Ovens are not piling any coke, preferring to sell coal direct rather than to turn it into coke and store it. No changes in prices are reported from either the Wise county, Pocahontas or New River districts.

Indian Ore

Of Manganese Grade Arrives for Carnegie Steel Co.

New York, Feb. 2.—After a lapse of several months, some cargoes of Swedish ore now are arriving in this country to fill old contracts with eastern furnaces. These cargoes are being carried in boats owned by the mining companies and on the return trips coal is being shipped to Narvik. Several cargoes of manganese ore have arrived from India at Baltimore and Philadelphia, upon which the embargo was lifted by the English government because these boats were loaded and ready to ship when the ban was laid. These cargoes are consigned to the Carnegie Steel Co.

Billet Prices

Named in Offers of Foreign Consumers Are Not Attractive

Philadelphia, Feb. 1.—Foreign buyers continue to make offers of $19, Baltimore, or $17.45, Pittsburgh, on tonnages of billets for export, chiefly for the British Isles. These offers are not attractive to eastern makers, however, who have the same export freight to Baltimore as the Pittsburgh mills. Some good business has been done with home buyers by certain eastern makers of special billets, but for the regular analyses, orders against contracts come in slowly. New business is very limited. A Camden buyer closed with an eastern maker for 300 tons of large billets. Billet prices are unchanged at $21.40, Philadelphia, or $19, Pittsburgh.

Semi-Finished Stronger

Pittsburgh, Feb. 2.—The Carnegie Steel Co. has withdrawn from the market for sheet bars and is offering material only to consumers who covered needs some time ago. Billets and sheet bars appear to be hardening, especially in the valleys, where makers are refusing to sell at minimum figures. Whether minimum quotations have disappeared entirely is unknown.

Disston's Diamond Anniversary

The firm of Henry Disston & Sons, Inc., Philadelphia, has just rounded out its 75th year as a manufacturer of saws. The original shop, which was founded by Henry Disston in 1840, was a very crude one, being equipped with a home-made furnace and few tools. There was a good demand for saws at that time, and in order to supply this demand, a plant for melting steel was built in 1854, the first crucible saw steel plant in the country. Twelve years later, a file works was built, and gradually the manufacture of a wide variety of tools was undertaken. From such a small beginning, the business of this company has increased until it now has a plant consisting of 58 buildings, covering 50 acres of ground and employing 3,600 men. Three generations of Disstons have administered the company's affairs and over a score of the employes have been with the company for more than 50 years.

Wire Mill Resumes

Birmingham, Ala., Feb. 1.—The big wire mill of the American Steel & Wire Co. resumed operations at Fairfield today, putting to work nearly 500 men after a shutdown of some time for repairs. The Ensley rail mill of the Tennessee company continues in operation on a reduced scale, having been running now for five weeks continuously after having been closed owing to lack of orders.

Conditions of the unemployed in Birmingham are very bad in some instances. Officials of the Birmingham Trades council claim there are between 12,000 and 15,000 men out of work. Several different plans to aid those who are actually needy are in operation.

Increasing Activity at Gary

Chicago, Feb. 2.—Operations at the Gary works of the Indiana Steel Co. have been increased over the schedule which has been in effect for some time and 16 open-hearths are active in place of 12, which has been the rule for several weeks. An additional blast furnace has been blown in, making four active out of eight at this plant. Increased demand on the finishing mills has called for more steel and this has increased the schedule of open-hearth operations. Beginning next Monday the rail mill will be started after an idleness of three months and more open-hearths will be lighted to equal the demand for ingots.

Harold S. Bope, who has been identified with the St. Paul office of the Carnegie Steel Co., has been appointed to succeed Wayne Bogue, resigned, at Detroit, where he will be associated with Frank E. Spencer.

(*For complete prices see page* 304.)

Spelter Prices Higher

Than Any Quoted in Thirty Years and There is Very Little Prospect of Relief

New York, Feb. 2.—The situation which for several weeks past, has existed in the spelter market is of a character sufficiently grave to give consumers of this metal cause for earnest thought. During the closing months of 1914 there was a steady, active demand for spelter from a number of foreign countries, but mainly from England and her allies, France and Russia. This was due to a cessation of operations at Belgian smelters, which are located in the heart of the war zone. The demand from abroad at first involved principally brass mill and other special grades, and when producers became so well sold up that they could take no more export business in these grades, the foreign demand shifted to prime western, and indeed, any grade that might be obtained. Simultaneously with this foreign demand there was a tremendous demand from domestic manufacturers of brass products who had booked large "war orders".

Early in January it readily was apparent that a very unusual condition existed in spelter. On continued foreign demand, prices began to ascend by leaps and by bounds. Several producers, and at least one large speculative interest were offering to buy spelter at premiums of $1 and $2 above the current market prices. These manifestations, however, did not awaken the trade to the true conditions, and statements by producers as to the extent to which their stocks had shrunk by reason of an unprecedented demand were not taken in earnest by consumers in general. This was true especially of the galvanizing industry, which, by reason of its own low schedule of operations for some time past, was, with a few exceptions here and there, in a mood to scout the idea of a shortage in the supply of spelter.

About two weeks ago consumers suddenly awakened to the situation. Producers gradually had been withdrawing from the market until there were practically no sellers left and consumers suddenly found they were unable to cover their requirements, a condition which they never before had faced. There was a wild scramble on the part of consumers to get the metal, particularly by practically all the big galvanizers. These interests succeeded in buying some spelter, but in amounts not at all commensurate with their needs. Buyers other than consumers found it impossible to get any of the metal at all. The suspicion frequently has been voiced that supplies could not be so near the vanishing point, and there has been considerable talk of "concealed stocks". This talk no longer is heard, as it is considered entirely improbable the present high prices would fail to bring about a liquidation of such stocks.

Prices have been ascending each day and now are higher than any quoted in 30 years. On prompt, February, March and April shipment, prime western can be had, in limited quantities only, at something higher than 8c, St. Louis. It already has been sold at 8c, St. Louis, which is equivalent to 8.15c to 8.20c, New York. May and June prime western can be had at $2 per ton less than the price of prompt and nearby. Brass special for May delivery is known to have sold at 9c, New York, and since is reported to have sold at 11.50c, New York, for prompt. On high grade spelter, higher than 14c, New York, has been done. Each succeeding sale brings an advance.

Producers say there is not much prospect for immediate relief. These interests say production is being increased, but it cannot go higher than about 75 per cent of capacity, due to the fact that few idle smelters have any ore on hand. Incidentally, the price of ore has ascended in spectacular fashion, the record price of $68 per ton having been paid last week. Producers naturally can look for a continuation of the demand throughout the duration of the war, and express their belief that even the termination of the war would not cause an immediate reaction, since it would be at least six months before Europe again could look to Belgian smelters for spelter supplies. Producers seriously intimate that the shortage of spelter will be so acute as to force users of galvanized sheets to depend on sheets having some other covering such as paint.

Copper Also Advanced

Copper at present is nearly as interesting a metal as spelter. With production continuing considerably below normal, the leading selling agencies, by reason of a large export demand from such domestic consumers as have booked "war orders", have been able to advance their asking prices almost daily. In fact, the prices asked by some interests indicates that they are so well sold up that they are desirous of discouraging buyers. For instance, one agency today asks 15c, delivered 30 days, on electrolytic, while others ask 14.87½c, delivered 30 days. The last sales, however, were made at 14.75c, delivered 30 days, and there still are some sellers at this figure. At the same time, limited quantities of the metal are available in the outside market at about ten points less. Sellers of prime lake have sold at 14.75c, cash, and now are asking 14.87½c, cash, for good brands. The asking prices on the best brands are 15c to 15.12½c, cash. Casting copper is quoted at 14.50c, delivered 30 days. Mine production has been considerably increased of late.

(For complete prices see page 304.)

Good Increase

In Corporation's Unfilled Tonnage—Export Business is Normal

New York, Feb. 3. (By wire.)—Indications point to an increase of more than 200,000 tons in the United States Steel Corporation's unfilled orders in January. The leading interest continues to increase operations and this week is up to 55 per cent against 50 per cent last week. Further gain is in prospect. Several more furnaces have been ordered in, including No. 2 Schoenberger, which will make recent additions total eight, including Ohio, Mingo, Gary, Lorain, Carrie and Duquesne.

The export business of the Corporation is now fully up to the point before the war and is practically normal, though distribution is considerably different.

Wants Supplies for Italy

Guilio Cicagnani, representing Enrico Chisler, of Genoa, Italy, is at the Hotel Breslin, New York City, and is interested in the purchase of crop ends and other iron and steel scrap, pig iron, ferro-manganese, ferro-tungsten, steel ingots, blooms, billets, bars, tubes and other metallurgical products and old and new metals, including copper, nickel, tin, spelter and lead. These materials all are wanted for shipment to Italy.

B. S. McConnell will be placed in charge of the Cleveland office of the Ayer & Lord Tie Co., Chicago, located at 801 Swetland building, succeeding F. A. Weaver, resigned. R. W. Slaney succeeds Mr. McConnell in the Chicago territory. The changes will be effective Feb. 15.

Pig Iron Production Shows Gain

Output in January Increases Decisively as More Furnaces Are Blown In—Steel Works Stacks More Active

THE HEAVIEST gain in output of coke and anthracite pig iron since the flurry in February and March of last year, was shown in January. Production last month was 1,591,024 tons, compared with 1,495,325 tons in December, a gain of 95,699 tons. In daily average output, the figures for the two months were 51,323 tons and 48,236 tons, a gain in January of 3,087 tons.

MONTHLY PRODUCTION.

	1915.	1914.	1913.
January	1,591,024	1,879,336	2,787,800
February ...	.....	1,888,607	2,578,670
March	.....	2,341,551	2,762,823
April	.....	2,261,501	2,754,353
May	.....	2,097,019	2,816,825
June	.....	1,904,566	2,616,883
Total 1st half.	.....	12,372,580	16,317,354
July	.....	1,955,324	2,558,275
August	.....	1,996,483	2,537,018
September .	.....	1,882,718	2,494,098
October	.....	1,767,227	2,539,924
November ..	.....	1,501,269	2,229,960
December ..	.....	1,495,325	1,976,138
Total 2d half.	.....	10,598,346	14,335,413
Grand total.	1,591,024	22,970,926	30,652,767

A decisive increase in the number of active stacks also was shown in January. There were 165 furnaces in blast on the last day of January, compared with 154 on Dec. 31, a gain during the month of 11 furnaces. The increase was made entirely by steel works or non-merchant furnaces, 15 of which were blown in, while four blew out, a net gain of 11. One merchant stack was relighted and one put out of blast.

The increase in tonnage produced also was due to the increased activity of steel works furnaces. Production of non-merchant iron in January was 1,099,563 tons, a gain of 88,739 tons over December, when 1,010,824 tons were produced. Daily average production of steel works furnaces in January was 35,470 and in December 32,607, a gain last month of 2,863 tons. Merchant furnaces produced 472,435 tons in January and 463,217 tons in December, a gain of 9,218. Their average daily output in January was 15,239 tons and in December 14,943 tons, a gain of 296 tons.

February doubtless will show a considerable increase in daily average production as the 11 non-merchant stacks which were relighted in January did not become active until the closing 10 days of the month, so that the full effect of their increased activity was not shown in the January production figures.

Production of ferro in January was 12,614 tons, against 10,987 tons in December, a gain of 1,627 tons. Spiegel production in January was 6,412 tons and in December 10,297 tons, a loss last month of 3,885 tons.

The merchant furnace blown in last month was Zenith, of the Zenith Furnace Co., Jan. 21. Lawrence, of the Marting Iron & Steel Co., was blown out on Jan. 3.

Steel works furnaces blown in were: Madeline No. 1, Inland Steel Co., Jan. 16; Gary No. 10, Indiana Steel Co., Jan. 27; one Central and one Donora, American Steel & Wire Co.; one Ohio, Jan. 26, one Mingo, Jan. 30, three Duquesne, Jan. 13, 21 and 30, respectively, one Carrie, Jan. 31, one New Castle, Jan. 23, and one Farrell, Jan. 23, Carnegie Steel Co.; one Haselton, Republic Iron & Steel Co.; Cambria No. 8, Cambria Steel Co., Jan. 11; Lebanon, No. 3, Pennsylvania Steel Co., Jan. 20.

Those blown out were: One La Belle, La Belle Iron Works; one Lucy, Carnegie Steel Co., Jan. 30; one Aliquippa, Jones & Laughlin Steel Co., and Lebanon No. 1, Pennsylvania Steel Co., Jan. 19.

One Edgar Thomson and one Carrie, of the Carnegie Steel Co., were scheduled to relight this week, while one Schoenberger, of the American Steel & Wire Co., was relighted Feb. 1 and the second stack is scheduled to go in blast next week. Jisco, of the Jackson Iron & Steel Co., was blown in Feb. 1 and Lynchburg, of the Oriskany Ore & Iron Corporation, which has been banked, will resume this month.

AVERAGE DAILY PRODUCTION.

	1915.	1914.	1913.	1912.
Jan. ...	51,323	60,624	89,929	66,220
Feb. ...	.....	67,450	92,095	72,372
Mar. ...	.....	75,534	89,123	77,791
Apr. ...	.....	75,383	91,812	79,254
May ...	.....	67,646	90,865	80,753
June ...	.....	63,486	87,229	81,125
July ...	.....	63,075	82,525	77,502
Aug. ...	.....	64,403	81,839	80,650
Sep. ...	.....	62,757	83,137	81,482
Oct. ...	.....	57,007	81,933	86,569
Nov. ...	.....	50,042	74,322	87,985
Dec. ...	.....	48,236	63,746	89,590
Average	.....	62,934	83,980	80,124

JANUARY PIG IRON

States.	No. of stacks.	No. in blast last day of month. Jan.	Dec.	Total tonnage made. Merchant.	Non-Merchant.	—Totals— Jan.	Dec.
Pennsylvania	157	70	64	109,495	567,940	677,435	637,095
Ohio	73	34	32	100,142	262,368	362,510	331,539
Alabama	45	16	16	106,615	36,801	143,416	143,763
Virginia	22	4	4	13,121	.....	13,121	12,315
New York	26	12	12	69,791	49,999	119,790	114,646
New Jersey	6	1	1	6,564	.....	6,564	6,793
Illinois	26	8	8	11,951	76,355	88,306	82,315
Colorado	6	2	2				
Indiana	10	6	4				
Maryland	4	1	1				
Wisconsin	6	2	2	14,838	99,447	114,285	98,548
Kentucky	7	1	1				
West Virginia	4	1	1				
Tennessee	18	4	4				
Washington	1	0	0	20,571	6,653	27,224	32,877
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	1	1	0				
Michigan	3	2	2				
Missouri	1	0	0	19,347	.....	19,347	14,150
Spiegel—All states...						6,412	10,297
Ferro—All states....						12,614	10,987
Totals	421	165	154	472,435	1,099,563	1,591,024	1,495,325

Flood Danger

In Pittsburgh District Passed—Waters Receding

Pittsburgh, Feb. 3. (By wire.)—Dangers of a disastrous flood at Pittsburgh were passed last night when the waters of the rivers started to recede after a stage of 28.5 feet was registered. Men at many of the mills were compelled to suspend operations for the afternoon, but property damage has not been heavy. The Carnegie Steel Co. was forced to bank two blast furnaces at Bellaire and one at Mingo on the lower Ohio river.

Failed to Agree

Pittsburgh, Feb. 3. (By wire.)—The conference yesterday between the Amalgamated Association and owners of mills operating under the association schedule failed to bring about an agreement on readjusting the existing wage scale. Separate meetings are being held this morning and a joint session has been called for this afternoon at the Fort Pitt hotel.

The Steel for Modern Motor Cars

How Five Standard Grades of Steel Have Been Developed to Replace 200 Specifications Formerly in Use

PARADOXICAL as it may seem, it is now generally recognized that the manufacturers of the so-called cheap automobiles find it necessary to give more attention to the quality of the materials entering into their cars than do makers of high grade machines.

In a high-priced car, strength can be assured by the employment of ample metal sections; in a cheap car, weight is an all-important item, consequently the unit stresses on the material are high and the apparent factors of safety are less. It is imperative, therefore, that the material not only be of superior quality, but that it be uniform.

When making automobiles in lots of a thousand, there is no time to test each individual piece and it would be financial suicide to take chances. Therefore, some systematic method of testing and inspection must be adopted which will insure uniformity in the quality of the materials, as well as in the dimensions of the pieces. For instance, the steel in crank shaft No. 5000 must be exactly like that in shaft No. 1, and furthermore these two must be similar to all the shafts that have gone between. In other words, the idea of interchangeability must be carried out to its ultimate conclusion.

To do this successfully, the plant must be provided with suitable laboratory facilities and the car must be designed as much in the laboratory as in the drawing room. Before the dimensions of a part can be determined, the weight must be fixed and the proper quality of metal decided upon. It is undoubtedly true that the manufacture of modern, light, moderate-priced automobiles has brought about the production of such steels which will stand shocks and stresses that a few years ago would have been considered impossible. The metal is subjected to unit stresses double and even triple those formerly considered good practice in locomotive shops or marine engine building shops.

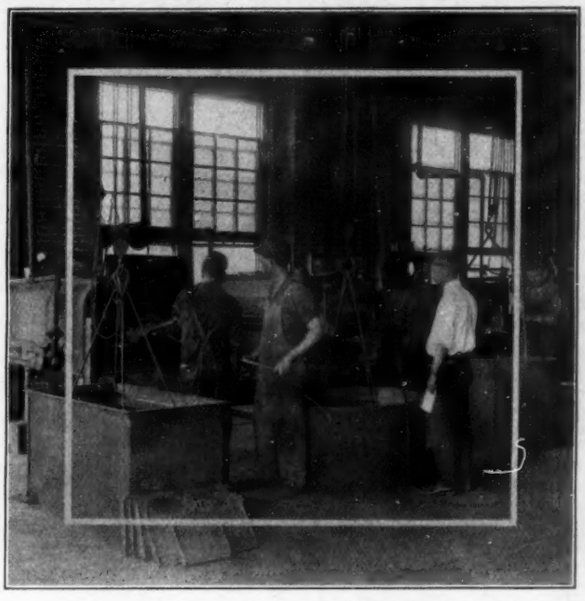


FIG. 1—QUENCHING SMALL PARTS IN OIL

FIG. 2—HEAT TREATING A CRANK SHAFT

Among the various automobile factories in the city of Detroit, that of the Maxwell Motor Co. is provided with unusually interesting equipment for testing, inspecting and heat treating steel in order to prepare it to meet the demands outlined above. The facilities of the Maxwell Motor Co. include completely equipped chemical and physical laboratories, the latter being provided with apparatus for making tensile, compression, transverse and torsion tests; a micro-photographical department and elaborate heat-treating equipment also is available. The Maxwell Motor Co., as is generally known, is the successor of the United States Motor Co., which was obliged to go through bankruptcy.

It had been the policy of the old company to attempt to specify a different kind of steel for practically every part. This, of course, resulted in obtaining material which, theoretically at least, was ideally fitted for the service expected of it, but at the same time, there was considerable confusion in the shop owing to the large number of different kinds of steel employed. At one time the old company was purchasing its material according to 200 different specifications. One of the first tasks of the new organization was to reduce this array of detail to practical working limits.

A series of investigations was made and as a result specifications for five different kinds of steel were drawn up which cover all of the requirements of the shop. In fact, four of these steels include practically all of the parts in the car, the fifth being used only in a few relatively unimportant cases. Of course it is impossible by this method to fit the steel exactly to the requirements of the part, but this difficulty is readily overcome by providing metal for a certain number of parts which is somewhat stronger than would be absolutely necessary. This also has the effect of increasing the factor of safety in a large number of cases.

Of the four important classes of steel, two are intended for forging and two for case hardening; two of the specifications call for plain carbon

THE MAXWELL MOTOR CO., INC TESTING LABORATORY

Test No. Date Received Part No.

Sample of

For Reported to Lab.

Cards

Sheet

Fig. 3

THE MAXWELL MOTOR CO., INC TESTING LABORATORIES

Tensile Test No. Date Tested Part No.

Sample of

For

Ultimate Stress in Pounds per Square Inch

Elastic Limit in Pounds per Square Inch

% Elongation in Two Inches

% Reduction in Area

Hardness

Remarks:

Fig. 4

THE MAXWELL MOTOR CO., INC. TESTING LABORATORY

Torsion Test No. Date Tested Part No.

Sample of

For

Diameter of Test Piece Length

Moment in pound-inches at E. L. at failure

Angle of Torsion at E. L. at failure

Stress in pounds per square inch at Elastic Limit

Shearing Modulus of Elasticity

Remarks:

Fig. 5

THE MAXWELL MOTOR CO., INC. TESTING LABORATORIES

Analysis No. Date Tested Part No.

Sample of

For

Carbon (Combined)	%	Tin	%
Carbon (Graphitic)	%	Lead	%
Manganese	%	Zinc	%
Sulphur	%	Antimony	%
Phosphorus	%	Copper	%
Silicon	%	Iron	%
Chromium	%	Aluminum	%
Nickel	%		%
Vanadium	%		%

Remarks

Fig. 6

Fig. 7

MAXWELL MOTOR CO., INC TESTING LABORATORIES

Test No. Date Tested Part No.

Sample

Magnified diams. Objective Eyepiece

Exposure Etching

PHYSICAL PROPERTIES

Ultimate Strength lbs. per sq. inch

Elastic Limit lbs. per sq. inch

Elongation in 2 inches %

Reduction in Area %

Hardness

HEAT TREATMENT

CHEMICAL COMPOSITION

C (comb.) %

C (graph.) %

Mn %

Si %

S %

P %

Remarks

Fig. 8

THE MAXWELL MOTOR CO., INC TESTING LABORATORY

Test No. Date Tested Part No.

Sample of

For

Remarks:

FIG. 3—THIS CARD SUMMARIZES THE TESTS AND GIVES THE LOCATION OF THE OTHER CARDS WHICH CONTAIN THE DETAILS OF THE ANALYSES

FIG. 4—DETAILS OF TENSILE TESTS ARE RECORDED ON THIS CARD

FIG. 5—TORSION TEST CARD

FIG. 6—CHEMICAL TEST CARD

FIG. 7—RECORD OF PHOTO-MICROSCOPIC EXAMINATION

FIG. 8—FORM FOR REPORTING MISCELLANEOUS TESTS

material and two call for alloy steels. For general forgings which do not need to be case hardened, an open-hearth 0.35 per cent carbon steel is used. This is known as No. 2 steel and the bars are painted black to distinguish them from the other classes. The chemical analysis is as follows: Carbon, 0.30 to 0.35 per cent; manganese, 0.50 to 0.70 per cent; sulphur under 0.04 per cent, and phosphorus under 0.04 per cent. Parts made of this steel are heat treated to relieve forging stresses and the general direction for the heat treatment are as follows:

1.—After forging, heat the steel to 1,650 degrees Fahr. and cool it slowly.

2.—Then heat it to from 1,475 to 1,525 degrees Fahr., the temperature varying inversely with the amount of carbon, and maintain at this temperature for about one hour. Then quench in water.

3.—Next heat the steel to 950 degrees Fahr. and maintain it at this point for a time which will vary with the size of the piece, but is generally one hour. Cool gradually.

Another steel is used for crank shaft forgings, time gear shafts, levers and other parts requiring considerable strength. It is made from basic open-hearth material and the carbon averages 0.40 per cent. It is known as No. 6 steel and the bars are painted black and red. The tensile strength is about 100,000 pounds and the elastic limit 85,000 pounds. It will be noted that the elastic limit is 85 per cent of the tensile strength. The chemical analysis is as follows: Carbon, 0.35 to 0.45 per cent; manganese, 0.50 to 0.70 per cent; sulphur and phosphorus, both under 0.04 per cent. This steel is not intended for case hardening. Its general heat treatment is as follows:

1.—After forging, heat to 1,650 degrees Fahr., and cool slowly.

2.—Heat to 1,450 to 1,500 degrees Fahr., the higher temperature being required for the lower carbon limit, hold at an even temperature for about an hour and quench in water.

3.—Heat to 950 degrees Fahr., and maintain at this temperature for an hour, more or less, according to the size of the part.

For parts which are subjected to severe stresses and shocks, a chrome-nickel alloy steel is employed. This material may be either simply forged or forged and case-hardened, according to the amount of carbon it contains. The steels are known as natural alloys and No. 11 steel is made from crucible stock with an average carbon content of about 0.21 per cent. The bars are painted dark blue. The tensile strength is approximately 125,000 pounds per square inch, the elastic limit about 100,000 pounds and the reduction in area about 50 per cent. The chemical analysis of this steel is as follows: Carbon, 0.15 to 0.25 per cent; manganese, 0.30 to 0.50 per cent; sulphur and phosphorus each under 0.04 per cent; chromium, 0.45 to 0.60 per cent, and nickel 1.10 to 1.30 per cent. This steel is used for case hardening and the heat treatment is as follows:

1.—After forging, heat to 1,640 degrees Fahr., and cool slowly.

2.—After machining, carbonize at 1,650 degrees Fahr. for sufficient time to secure the depth of hardness desired. Five hours is usually necessary. Cool in the annealing box.

3.—Heat at 1,600 degrees Fahr. and quench in oil or water, according to the temper desired.

4.—Draw in hot oil at 350 degrees Fahr.

For parts where the service is unusually severe, a 0.35 per cent carbon, chrome-nickel alloy steel is used. It is known as No. 12 steel and is painted white. The chemical analysis is as follows: Carbon, 0.35 to 0.40 per cent; manganese, 0.30 to 0.50 per cent; sulphur and phosphorus, both under 0.04 per cent; nickel, 1.10 to 1.30 per cent; chromium, 0.45 to 0.65 per cent. The tensile strength of this steel is 150,000 pounds per square inch; the elastic limit is 125,000 pounds, and the reduction in area is 50 per cent. The hardness number is 40. This steel is not used for case hardening and its heat treatment is as follows:

1.—After the forging operation heat to 1,625 degrees and cool slowly.

2.—Heat to 1,525 or 1,550 degrees and quench in oil or water.

3.—Heat to 1,000 degrees and maintain this temperature long enough to secure the desired result, usually about an hour is sufficient. Small bolts, ⅜ inch in diameter, which are drawn in hot lead need be maintained at 1,000 degrees for only 15 or 20 minutes; parts 1½ inches in diameter would require this treatment for an hour or an hour and a half.

The fifth kind of steel, known as No. 1, consists of ordinary open-hearth stock sufficiently low in carbon to be ductile and to permit case hardening. The bars are painted moss green. The analysis of this metal is as follows: Carbon, 0.15 to 0.25 per cent; manganese, 0.55 to 0.75 per cent; sulphur, 0.04 per cent and under; phosphorus, 0.04 per cent and under. The

FIG. 9—ANNEALING SHEETS AND BANDS

FIG. 10—CASE HARDENING FURNACES

method of heat treatment is as follows:

1.—Carbonize for a sufficient time to secure the desired depth of treatment, temperature ranging from 1,650 to 1,700 degrees Fahr. Permit the steel to cool in the annealing boxes.

2.—Heat to from 1,550 to 1,625 degrees Fahr., the temperature varying inversely with the amount of carbon, and quench in oil, water or brine, according to the result desired.

3.—Heat to the lowest temperature at which the piece will harden, approximately 1,400 degrees Fahr., and quench in water, oil or brine.

4.—Draw in hot oil at about 350 degrees Fahr.

Where trouble arises from shrinkage after hardening, additional treatment may be necessary before the part is machined. It will be understood that the heat treating directions quoted above cover general cases only. It is the practice of the Maxwell Motor Co. to make a special study of the heat-treating requirements of each part in order that the maximum efficiency may be obtained in the use of the material. Therefore, the treatment for each individual part of the machine varies slightly from the foregoing general directions. These variations are determined by trial and experiment, coupled with repeated and careful chemical and physical tests.

For bushings and bearings, two kinds of phosphor bronze are used. Steering bushings, worm wheels, etc., are made from a hard bronze of the following composition: Copper, 88.7 per cent; tin, 11 per cent; phosphorus, 0.3 per cent. The bearing metal generally used is of the following composition: Copper, 80 per cent; tin, 10 per cent; lead, 9.7 per cent; phosphorus, 0.3 per cent.

The main chemical laboratory is about 45 feet long and 40 feet wide. It is equipped with modern apparatus for rapid and accurate steel analyses. Exhaust hoods are provided which ef-

FIG. 11—A CORNER IN THE HEAT TREATING DEPARTMENT

fectually remove all fumes. The sinks are lined with porcelain and the woodwork and fixtures are carefully painted. The balances, of which there are three, are in a room separate from the main laboratory, which is also used for an office. The apparatus for making micro-photographs includes a polishing table, camera and suitable dark room facilities. In the physical laboratory there are tension and torsion machines of standard manufacture, together with a machine especially designed to test springs. Springs are tested to destruction and the number of vibrations necessary to break the leaf are recorded. Suitable apparatus is also provided in the laboratory and at various points in the shop for testing the hardness of the steel.

Samples are taken from every lot of steel or other material received and thoroughly inspected before acceptance. If the shipment is unusually large, several samples may be required. The samples are subjected to physical, chemical and microphotographical examination and the results are recorded on a series of cards. As shown in the accompanying illustrations, there is a separate card for each individual test together with a record, or master card, which contains a summary of all the tests and proper cross references to the cards giving the detailed information. These cards are 4 x 6 inches and are filed vertically in standard cabinets. Each test is given a distinctive number for purposes of identification.

The company is at the present time installing additional heat treating apparatus which will considerably enlarge its facilities. The equipment now in service includes double furnaces built by the Gilbert & Barker Mfg. Co., Springfield, Mass., and single furnaces furnished by the Strong, Carlisle & Hammond Co., Cleveland. Suitable quenching tanks, benches, transfer trucks, tote boxes, etc., are also provided.

Pyrometers Are Standardized

The temperature in each furnace is controlled by an electric pyrometer which is connected with an indicating instrument in the furnace room and a recording instrument in the laboratory office. The latter is arranged so it may be connected to any furnace at the will of the metallurgist. The indicating pyrometer is also wired so that the foreman in the heat treating room may instantly determine the temperature of any particular furnace. The pyrometers are inserted through the rear wall of the furnace. Two openings about 4 inches apart are provided. The working pyrometer is inserted in the lower opening and the standard pyrometer may be inserted in the upper opening, in order to check the working pyrometer. This arrangement makes it certain that both the standard and the working pyrometers will be subjected to the same temperature. The cold units of the thermo-couples are maintained at a constant temperature in a water bath. In order to be sure that the instruments are in good order, the working pyrometers are compared daily with the standard and any variation is noted. In general, the work is conducted within a limit of error of 25 degrees Fahr. The heat treating work is under the direction of the laboratory department, which is operated independent of the production department and no material is delivered to the shop until it is approved by the inspection department.

FIG. 12—LABORATORY OFFICE—MAXWELL MOTOR CO.

Oil Hole Drill

A new type of oil hole drill recently has been developed by the Cleveland Twist Drill Co., Cleveland. The holes run through the solid metal conforming to the twist of the flutes and the lubricant is delivered directly behind the cutting lips of the drill. It is said that this construction does not interfere with the strength and durability, and allows the uninterrupted delivery of the lubricant at any desired pressure. Drills of this type are particularly suitable for drilling holes where the depth exceeds twice the diameter.

Wightman D. Roberts, Huntington, W. Va., has written and published an interesting booklet entitled "The Man with a Job". It aims to bring out clearly some of the arguments against socialism and government ownership. It is written in the first person and was prepared as the result of a suggestion by a manufacturer to provide something that would fortify his workers against socialistic literature and the professional agitator.

Never start a new engine or machine without examining the fit of the bearings and knowing it to be right.

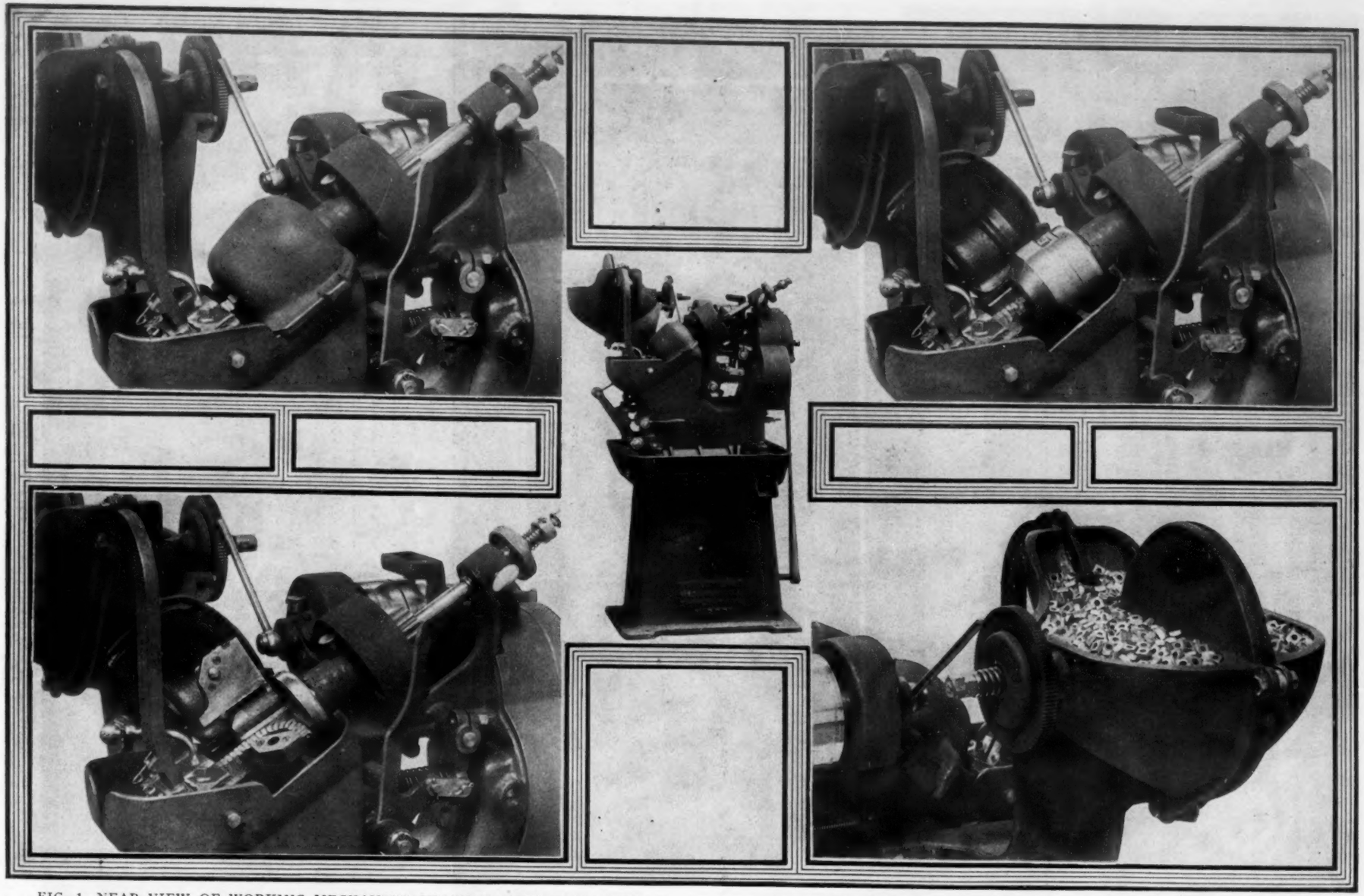


FIG. 1—NEAR VIEW OF WORKING MECHANISM SHOWING HOW GEARS, ETC., ARE GUARDED

FIG. 2—HEAD COVER OPEN SHOWING A NUT ABOUT TO BE EJECTED

FIG. 3—NATIONAL AUTOMATIC NUT TAPPER

FIG. 4—TAP HOLDER OPEN SHOWING NUTS PASSING OVER TAP

FIG. 5—FEED HOPPER AND RATCHET OPERATING FEED VANES

Automatic Continuous Tapper

Details of a New Nut Threading Machine Utilizing the Bent or Curved Tap Principle

MORE ENERGY and inventive genius have been expended, perhaps, on the bent or curved tap principle in an effort to develop a continuous, non-reversing nut tapper than have been spent in the development of any other class or type of bolt and nut machinery. After considerable experimenting, the National Machinery Co., Tiffin, O., has developed a machine which it is believed fulfills all the possibilities recognized in this principle on lines even simpler than embodied in the theories and dreams of the early experimenters. The simplicity of this new tapper, it is claimed, is one of its notable features, secondary only to the unusual outputs and tap life that the trial machines have shown. The National Machinery Co. is building this tapper in four sizes for ¼, ⅜, ½ and ¾-inch nuts. The details of the machine are shown in the illustrations on the facing page.

The hopper or container for the blanks is unusually large. On the smaller size machine it accommodates about 80 pounds of blanks, this giving the operator considerable time between fillings, enabling him to attend a battery of from six to 10 machines. A vane type feed progresses the nuts from the hopper to the feed chute, and gravity brings the blanks down and into position against the plunger or starter. There are four feed vanes, and they are so enclosed that the pressure or weight of the blanks, it is said, cannot interfere with their operation. These vanes are rotated by a ratchet and pawl off the driving shaft. The ratchet is held between friction flanges so that in case scrap or thin nut blanks tend to wedge in the nut groove and interfere with the vanes, the ratchet merely slips, and damage is prevented.

Operation of Machine

The tap spindle and injector or starter are inclined at an angle, and the blanks come out of the feed chute at a similar angle, causing each blank to lay against the starter as it is advanced onto the tap. The angle of the starter is such that the lubricant keeps the face free of chips. The blanks lay or bear flush against the starter, and are thus tapped square with the bearing face.

The tap spindle has a slight lateral travel, and is counter-balanced, giving it a floating movement. After the starter has fed the blank part way onto the tap, the spindle descends during the completion of the tapping, thus keeping the blank stationary while it is being tapped, in place of pulling it through the nut holder or guides.

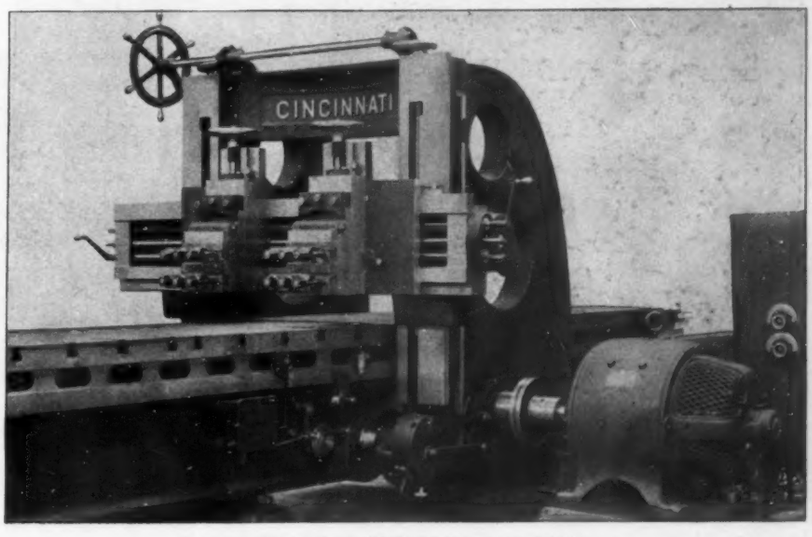
The course of the nut after being tapped, in other words its travel up the shank and off the end of the tap, is shown in Fig. 4. The hood or cover over the head serves to direct the nuts ejected from the tap into the chute that conveys them out of the machine into boxes or kegs.

It follows, of course, that the better quality of blanks being tapped, with special reference to freedom from burrs, holes of correct size, free cutting stock and blanks of correct dimensions, the higher the machine's efficiency. All blanks before being dumped into the hoppers are sorted for scrap, slugs, etc., but should any scrap accidentally enter and be passed through the feed chute and fed against the tap, an automatic relief shifts the belt and stops the machine.

The design is intended primarily for tapping square nuts, but it is claimed hexagon nuts of good quality can be handled. Also by making a gear change, the rate of feeding—number of nuts tapped per minute—can be regulated to suit the kind of nuts being tapped. As an example, in the ⅜-inch size machine, it is said 40 nuts of shop size can be tapped per minute if the stock is free cutting, holes are full size, etc., whereas United States standard nuts, being thicker, require more turns of the tap to a nut, hence 30 nuts per minute are recommended. This also applies when nuts are of tough stock or when holes run smaller than standard. Standard taps may be employed.

A Motor Driven Slide Plate Planer

THE accompanying illustration shows a planer recently placed on the market by the Cincinnati Planer Co., Cincinnati. This machine is built for extra heavy duty and takes pieces up to 48 inches in width, 24 inches in height and 20 feet in length. The purpose of the machine is to rapidly plane the ends of steel slide plates used under switch points. These are 18 inches long and about 6 inches wide; they are planed in about 6 inches long from the end and ¼ inch deep. The table is loaded with two rows of plates and four tools are used, two in each head. This reduces the distance necessary to feed the heads one-half, or to 3 inches. The full depth is taken in one cut at 40 feet



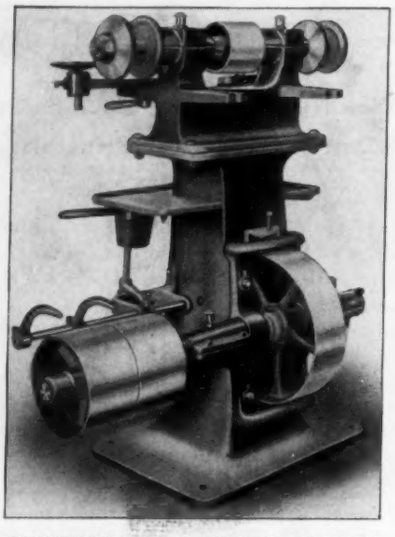
TWO HEAD SLIDE PLATE PLANER

per minute. In order to facilitate rapid chucking and unloading, special slots are cast in the top of the table which open to the sides. The table is box type, provided with two inner guides between the V and is further held down by adjustable gibs at the sides. The driving gears and table rack are steel.

The bed is of four wall design, having extra inner walls between the cross girths the entire length of the bed. The bed is bored for the shaft bearings, which are internally ground and fitted into place. The housings are of box form, carried down to the floor line and fastened to the sides of the bed by tongues, bolts and dowels.

The rail is clamped to the housings by four clamps, two on the outer and two on the inner sides of the housing face. The heads are taper gibbed throughout and the dovetail for the down slide is cast solid with the saddles, thereby eliminating one extra joint. The clapper box is steel, provided with three bolts and clamps, so arranged that the two tools can be clamped in each head. A new style clamp is used for holding the clapper box at the top. Instead of the usual cored slot and two bolts, a clamp of the full width of saddle, with three bolts, is provided. The machine is driven by reversible motor coupled directly to the driving shaft. This gives a suitable variation in cutting and return speeds, each independent of the other. The gears are covered to safeguard the operator against accident.

The third issue of *Steel Castings*, published by the Tropenas Converter Co., New York, contains an interesting paper on "The Electric Arc Furnace and the Development of the Steel Casting Industry", by Ivar Rennerfelt, together with a critical discussion by G. Muntz, entitled "The Limitations of the Electric Furnace in the Manufacture of Steel Castings". These two articles present interesting and contrasting views of the electric furnace as a factor in the steel casting industry.



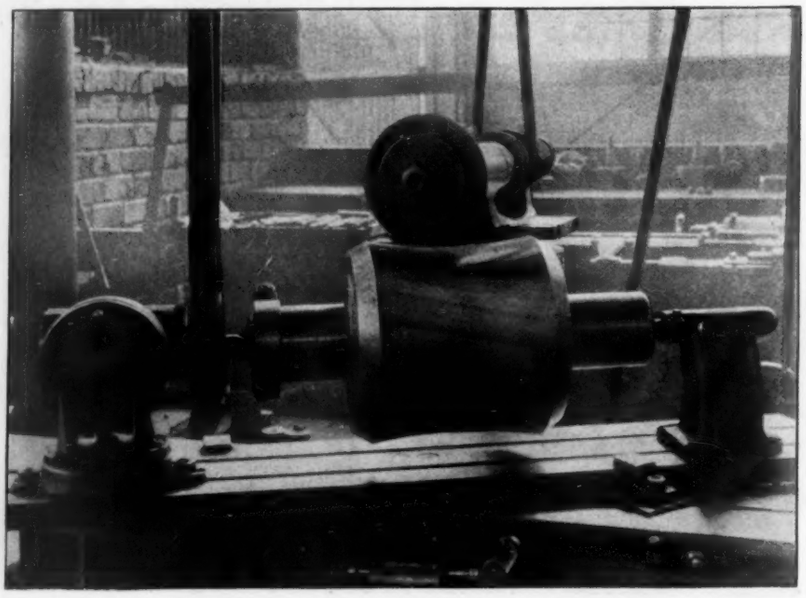
COUNTERSHAFT GRINDING MACHINE

A Countershaft Grinding Machine

A self-contained countershaft grinding machine has been developed by the St. Louis Machine Tool Co., St. Louis. It is designed for locations close to a line shaft and is said to have several advantages. The countershaft is a part of the machine and, therefore, it is not necessary to attach it to the ceiling and line it up. The belt strain comes against the body of the machine, which is said to result in unusually smooth running. The machine is equipped with a belt tightening device which consists of a frame attached to the column by milled square jibs; it is adjusted by means of a screw. The wheel guard consists of a steel channel rolled to a circular shape. It is reinforced by a heavy cast iron bracket which is riveted to the inside of the channel. The bracket is attached to the back rest on the machine by a bolt which slides in a slot. This permits the guard to be adjusted backward as the wheel wears. The lips of the guard, it is said, can be kept close to the wheel where they will not be in the operator's way. These machines are built in six sizes for wheels ranging from 1½ x 6 inches to 3 x 16 inches. The smallest machine weighs 147 pounds and the largest 520 pounds.

Device for Grinding Concave Rolls

The Woods Engineering Co., Alliance, O., has designed a special extension head for its tool and cutter grinder for grinding concave rolls. This head may be swiveled and the work is handled by setting the machine with the top table at an angle and swiveling the grinding head until the wheel is over the center of the roll. The amount the top table is swiveled determines the radius to which the roll will be ground. The face of the grinding wheel is shaped to form a radius of about ⅜ inch. This is necessary from the fact that the wheel is cutting on one side at one end of the roll and on the opposite side at the other end. After the job is once set, the table has only two motions, longitudinally and vertically. The longitudinal and cross-feeds have been improved and simplified, reducing the number of parts and providing the cross-feeds with a range of speeds suitable for either cylindrical or surface grinding.



DEVICE FOR GRINDING CONCAVE ROLLS

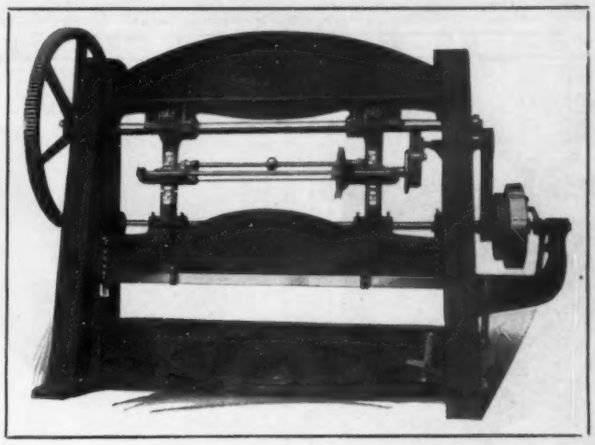
Chalmers & Williams, Chicago Heights, Ill., have taken over the exclusive sales and manufacturing rights on the Symons line of crushers, including coarse disc crushers, fine reduction disc crushers and pulsating screens.

Clinton H. Scovell & Co., industrial engineers and certified public accountants, 110 State street, Boston, announce that they have established offices in Springfield, Mass., New York City and Chicago.

The Springfield office, which is in charge of Frank L. Willis, is located at 293 Bridge street; the Chicago office is in the Edison building, at 72 West Adams street, and is in charge of Frederick S. Willet; in New York a combination has been effected with Wright, Schooley & Morse, and their offices and organization in the Woolworth building will be continued under the direction of A. J. Moyer, resident manager. Clinton H. Scovell & Co. have issued three interesting booklets covering industrial engineering, scientific management and the cost department.

New Cornice Press

The accompanying illustration shows a cornice press which recently has been placed on the market by the J. M. Robinson Mfg. Co., Cincinnati.



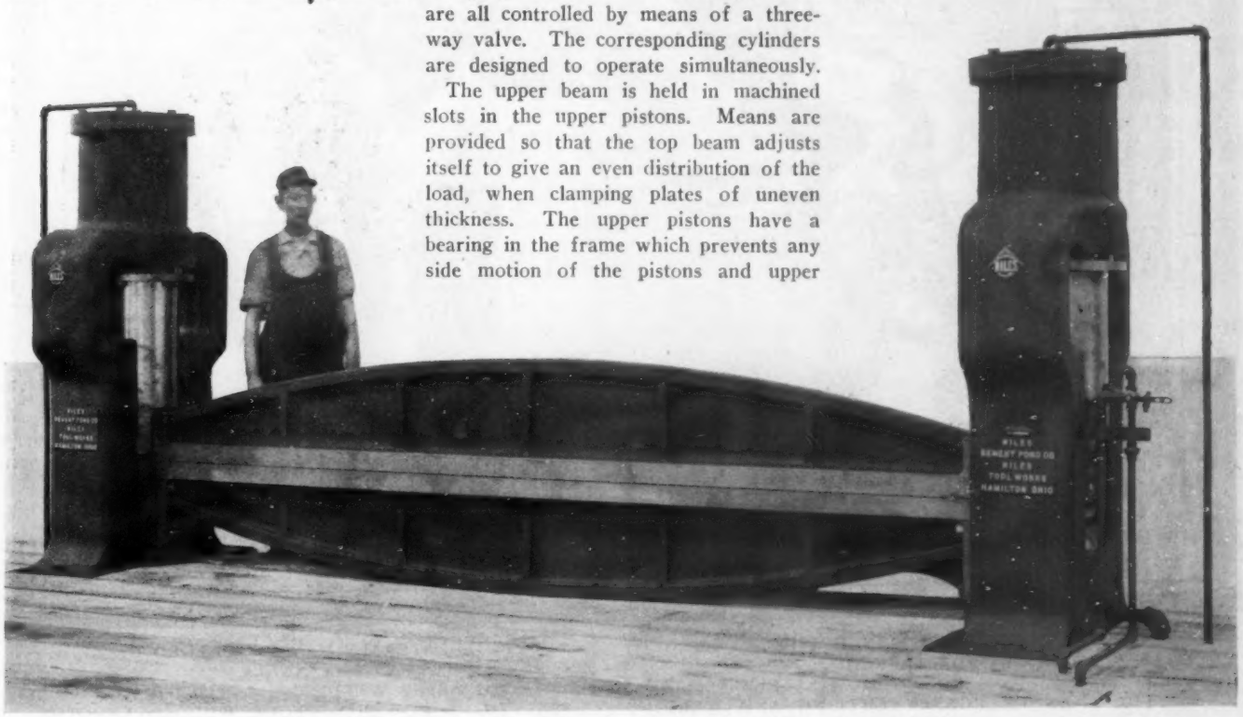
NEW CORNICE PRESS

This press is intended for use in shops where formed sheet metal is handled in quantities; in its design, rigidity and compactness have been specially sought for. The legs and arches are formed to afford a maximum resistance against operating strains. The legs are open on the end to take out work that may require forming over the dies. The friction belt wheel is of heavy design and serves the purpose of a balance wheel. The clutch, which is a part of the belt wheel, can be worked either with the foot or with a hand lever. The clutch is so designed that the plunger can be stopped at any point in its stroke. This feature is said to be of considerable assistance in setting dies. The plunger slide is guided in gibs. The plunger is fitted with patented clamp for holding the top die. The machine shown in the accompanying illustration weighs 28,000 pounds and has sufficient capacity for forming steel up to No. 10 gage. The fly wheel, which is 33 inches in diameter, operates at 330 revolutions per minute. The distance between housings is 10½ feet. The stroke of the plunger is 3 inches and the adjustment of the plunger is 6 inches.

Pneumatic Plate Flanging Clamp

THE accompanying illustration shows a plate flanging clamp on which the clamping beam is not only raised and lowered by air pressure, but also clamped by this means. The machine is built by the Niles-Bement-Pond Co., New York. On previous designs the top beam was elevated by air pressure, but it was clamped by means of screws and hand-wheels. The upper beam is moved by four cylinders. There are two lower and two upper pistons, the lower ones being used for elevating and lowering and the upper ones for clamping the beam. These operations are all controlled by means of a three-way valve. The corresponding cylinders are designed to operate simultaneously.

The upper beam is held in machined slots in the upper pistons. Means are provided so that the top beam adjusts itself to give an even distribution of the load, when clamping plates of uneven thickness. The upper pistons have a bearing in the frame which prevents any side motion of the pistons and upper clamping beam. This machine is built in several sizes, the one illustrated having a capacity for plates 12 feet wide. The clamping cylinders are said to exert an effective pressure of 15 tons at an air pressure of about 80 pounds per square inch.



PNEUMATIC PLATE FLANGING CLAMP

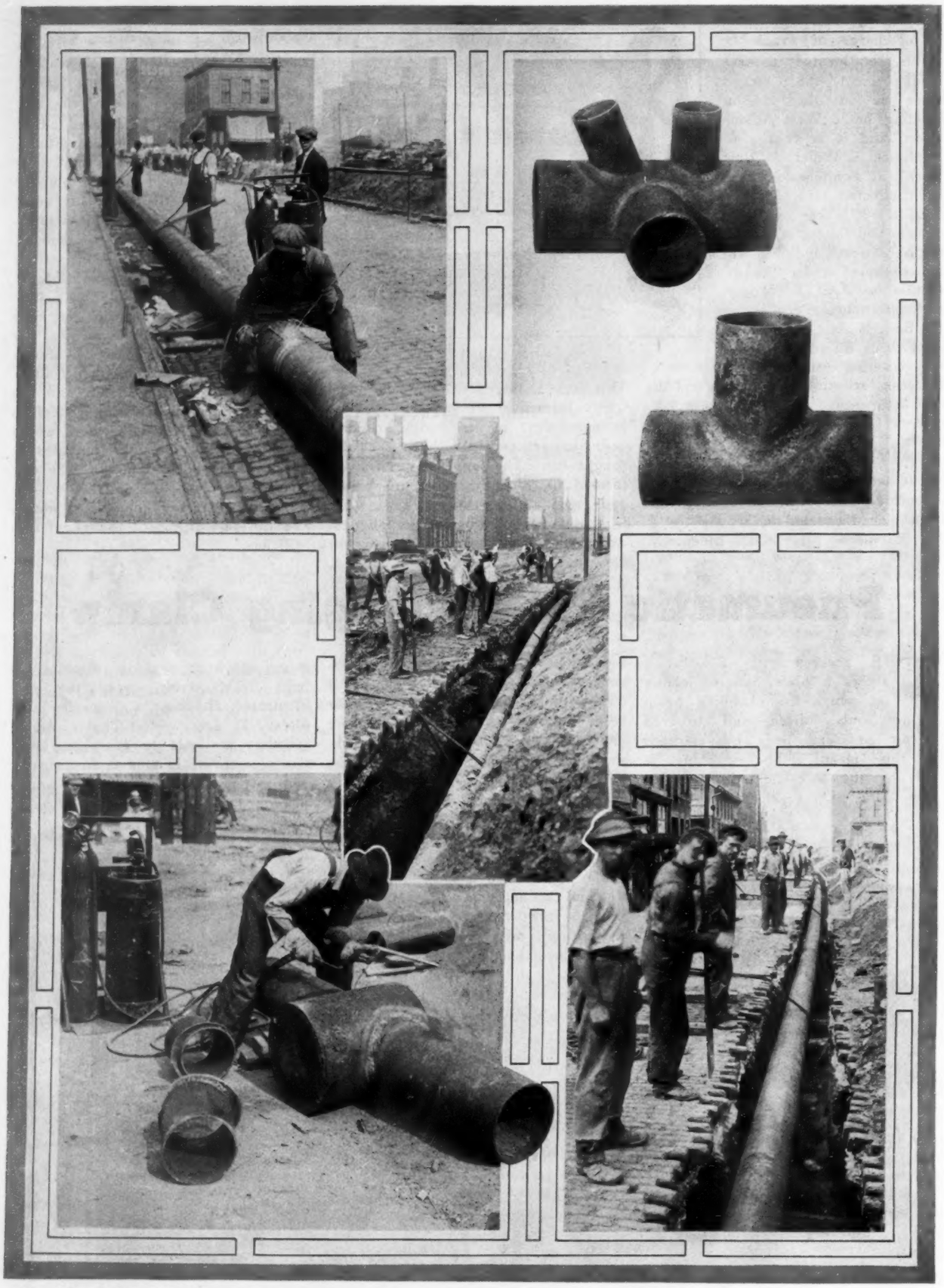


FIG. 1—WELDING 12-INCH PIPE OUTSIDE TRENCH

FIG. 2—LATERALS MAY BE WELDED ON AT ANY ANGLE

FIG. 3—SHOWING FLEXIBILITY AND STRENGTH AFTER WELDING

FIG. 4—AN EMERGENCY CUTTING AND WELDING OPERATION

FIG. 5—LOWERING FOUR WELDED LENGTHS, EACH 40 FEET LONG

Acetylene Welding of Gas Pipe

Interesting Details of a New Form of Joint That Has Been Employed Extensively in Europe

BY GEORGE H MANLOVE

A PROCESS of welding joints in the construction of steel and wrought iron gas mains has been developed to take the place of threaded joints and couplings. Experience in this country, notably at Philadelphia, Chicago and San Francisco and also in foreign cities, has shown that welding is not only an economical method of making joints but that a welded main eliminates joint leaks and the maintenance cost due to insecure joints.

A skilled operator produces unions with 80 to 95 per cent of the strength of the pipe and by building up the sections at the weld the strength is increased even beyond that of the pipe. Joints of this strength permit great flexibility in construction and are said to insure absolute tightness.

The method of producing welded joints is simple. The pipes are strung outside the trench and the successive lengths are simply butted together and welded by the operator, who is assisted by a helper at each end of the section. The helpers turn the pipe with chain tongs so that the operator is always welding on top, in which position the fastest work can be accomplished. The welding flame, at a temperature of approximately 6,300 degrees, heats the metal on each side of the joint to the fusion point and pure Norway iron wire is fused with the pipe metal to form a fusion weld. The operator thus can build up the weld to any desired thickness.

With pipes cut squarely the sections are butted within 1/16 to ¼-inch of each other, according to the size of the pipe. However, pipe may be obtained, without increase in cost, cut at a bevel, in which case the two pipes are butted together, forming a V-shaped opening of about 60 degrees. With the ends cut in this manner, the weld can be made more quickly, at less cost and with less filling material.

The great strength of the welded joint has made practical the use of pipe in 40-foot lengths instead of 20-foot lengths commonly used with other methods. Much lighter pipe is also feasible as it is not necessary to make allowance in its thickness to permit threading. This results in a saving in cost and it is reported that in some parts of Europe, where welded joints have been in widespread use much longer than in this country, it has been demonstrated that pipe of 40 per cent less thickness may be utilized with the same results.

As soon as a section of the welded pipe is finished it is capped at both ends and tested for leaks at any desired pressure. After it has been tested it is rolled to the trench and lowered to place. Various methods are followed in doing this work, as is shown in the illustrations. It is one engineer's practice to drop the section bodily instead of lowering it with ropes or chains.

Although the trench should be graded as carefully as usually is the custom in ordinary practice, no care need be taken to have the pipe absolutely straight. In fact a few curves are desirable, as contraction and expansion are taken care of in this way. Experience has demonstrated this is the only provision necessary to take care of expansion and contraction.

The section of pipe after being rolled into the trench is welded to the main already laid, a bell hole being dug to allow the operator to weld entirely around the joint. The longer the sections are made before being placed in the trench the fewer bell holes are necessary and thus a saving is made in the cost of excavating. It is also much easier to weld above the ground, where the pipe can be turned, than in the trench, where the operator must work on both sides and bottom of the main in positions which do not allow as rapid work as when it is done entirely on top of the ground.

The length to which the pipe may be welded before lowering into the trench apparently is not limited. In city streets traffic conditions and the length of time which the trench may be kept open fix a limit, but in the open country it is not unusual to weld as much as 1,000 feet at a time and in one case 100 lengths of 8-inch pipe each 40 feet long were welded before being placed.

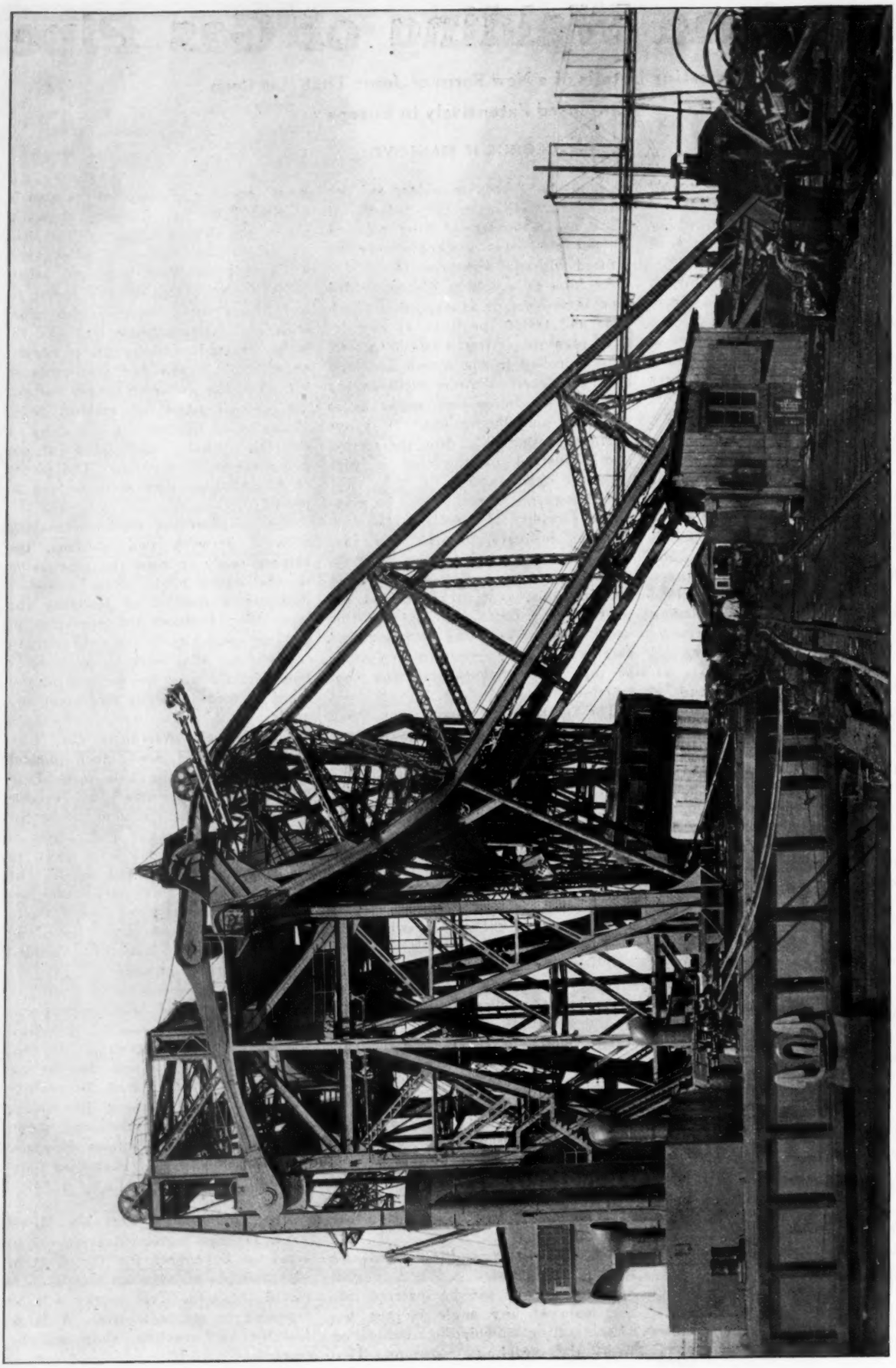
A convenience resulting from this method is illustrated in Fig. 2, indicating how laterals can be inserted into the main at any angle by the use of the cutting blowpipe in combination with the welding blowpipe. That great economy of time results also is illustrated in Fig. 4, which shows a job in the city of Chicago. The drip on which the workman is engaged was made in the shop and when ready to be placed it was found to have been fitted with 10-inch pipe, whereas the main being laid was 12-inch. Instead of delay being experienced while a new drip was made at the shop, the workman simply cut out the 10-inch pipes by making holes 12 inches in diameter in the sides of the drip cylinder, the pieces cut out being shown at the left. The pieces of 12-inch pipe then were welded in place.

Fig. 1 shows the workman making a weld between two sections, the helpers ready to turn the pipe being in the background. Figs. 3 and 5 illustrate a method of lowering the pipe. Fig. 4 shows the operation of making specialties in the field without recourse to shop work. Fig. 2 shows how laterals may be welded onto a main as needed, of any size or at any angle.

The Oxweld Acetylene Co., Chicago, which has done much pioneer work in developing this method of welding, has perfected a portable welding unit which is shown just behind the operator in Fig. 1. It is readily wheeled about from place to place and is compact and simple. The illustrations for this article are furnished by courtesy of the Oxweld Acetylene Co. and were taken on jobs where pipe was being welded by the Oxweld process.

A booklet entitled "Permanent Fortifications" has been issued by the Armstrong Cork Co., Pittsburgh. It contains interesting facts regarding the use of heat insulating material for protecting the exposed surfaces of boilers, steam drums, boiler breechings, steam pipes, etc. The book contains 16 pages, including a number of interesting illustrations.

The Zimmerman Steel Co., Lone Tree, Ia., has purchased a site of 10 acres at Davenport for the erection of a new plant and when this is completed the Lone Tree works will be removed to the new site. A large foundry and machine shop will be erected.



WHAT HAPPENED TO THE AJAX WHEN TESTED WITH SLIGHTLY LESS THAN MAXIMUM LOAD

When subjected to a test load of 120 tons, the boom failed with the result shown above. This crane was chosen by the Canal Commission in preference to an American built machine. From four to six months will be required to repair it.

Courtesy Leslie's Weekly—Copyrighted.

Details of a National Disgrace

How a German Crane Preferred by Panama Canal Commission to American Product Failed to Make Good

PURCHASED by the United States government for the Panama canal; paid for by the American people; made in Germany while thousands of skilled American workingmen walked the streets jobless; not built according to specifications; not finished on time; collapsed, wrecked and ruined while being tested—such in brief is the sad story of Ajax, one of the two largest floating cranes ever constructed. The real history of the affair of the Ajax and Hercules has never been published and probably never would have been, had not the Ajax come to grief, thus focusing attention on a story that should make every patriotic American citizen see red.

As a part of the auxiliary equipment of the Panama canal, two huge floating cranes are to be provided for handling boilers and other extra heavy weights in and out of ships and for lifting lock gates and similar pieces of canal equipment. One of these cranes is to be stationed at each end of the canal. The cranes were designed specially so that they might serve as naval auxiliaries and be useful in handling big guns and other heavy equipment on the battle ships. The specifications called for a lifting capacity of 250 tons at 62-foot reach, thus making the cranes, it is believed, the largest of their kind ever constructed. They will be one of the great sights at Panama and if they are ever successfully completed they will form two gigantic monuments to German engineering ability, one at each end of an American-built canal. American self respect may well feel humiliated at this situation and pointing an accusing finger at certain government officials, ask—
Why?

The transaction is particularly odious because there is every indication that the American bidders were the victims of unjust and unfair discrimination on the part of the officers of the canal commission.

The commission advertised for bids for the cranes under date of Oct. 30, 1912, the invitation for proposals being signed by F. C. Boggs, Major, Corps of Engineers, U. S. A., general purchasing officer. The qualifications for bidders, specifications and other details were given in Isthmian Canal Circular No. 743. The first page of this circular contained the following significant paragraphs which were printed in italics:

"The attention of bidders is especially invited to those parts of the specifications which require the submission, with the proposals, of plans, specifications, descriptions, weights, dimensions, calculations, and other data.

"The requirements of these specifications are to be considered as a minimum. In making the award, the experience, reputation and facilities of the bidder as indicative of his ability to satisfactorily complete the work within the time specified, the quality of his design, the reaches, the speeds and simultaneous motions provided, and the character and quantity of materials he proposes to furnish, will be taken into consideration."

Don't forget this quotation in light of the facts which are given below.

The Story in a Nutshell

Two gigantic floating cranes are being built for the government as a part of the auxiliary naval equipment at the Panama canal.

Bids for the cranes were opened in Washington, Jan. 31, 1913, and the contract was awarded to a German firm, in face of strong competition from the United States.

The German price was lowest and was accompanied by a promise to finish the cranes quicker than anyone else, but—

The German bid was not according to specifications.

The cranes were not finished on time, are not done yet, in fact.

And the first one to be tried, the Ajax, collapsed under a test load of 120 tons.

While these cranes were being built by Germans, skilled American artisans tramped our streets begging for work and the money to pay for the cranes came from the pockets of the American people. Should this sort of thing be tolerated?

The Low German Bid

The bids were opened Jan. 31, 1913. There were four proposals, one from a leading firm of German engineers and machinists, to whom the award finally was made; one from a widely known firm of American crane builders; one from a prominent English constructor; and an informal proposal from Schniedam, Holland. There were, therefore, only three formal proposals. This in itself is significant in view of the great importance of the contract and the fact that it had been widely advertised. The scarcity of bids indicates that the specifications were unusually rigid, or that there were other circumstances connected with the transaction which prevented other responsible firms from even attempting to obtain the contract.

The German bid was $821,300; the English proposal was 230,000 pounds sterling, equivalent approximately to $1,118,000, and the figures of the American bidder were $1,450,000. It will be noticed that the English and American figures were above a million dollars, while the German bid was startlingly low. This would indicate at once that something was wrong, and such was the case.

A careful comparison of the bids showed that both the English and American concerns figured on a very much larger machine than the firm of German builders intended to construct. The American design called for a machine weighing 8,300,000 pounds, as against a weight of 5,960,000 pounds for the German crane. This difference in weight very largely accounted for the difference in price, the various prices per pound being practically the same. The collapse of the Ajax under test indicates that in this case the German builders miscalculated. A further comparison of the bids revealed the fact that the German machine would not quite make all the reaches that were specified in italics on the front page of the government circular quoted above. These reaches were to be considered a minimum, it will be remembered. The Germans took up this point on page 38 of their specifications, stating that "at a much increased cost with a correspondingly high figure in this tender, the outreaches could be increased over the end of the pontoon, etc." In other words, they deliberately fell short of the specified minimum and properly stated that they had. This consideration alone should have been sufficient grounds for rejecting the German proposal.

Other paragraphs in the specifications made it necessary to prepare numerous actual drawings showing

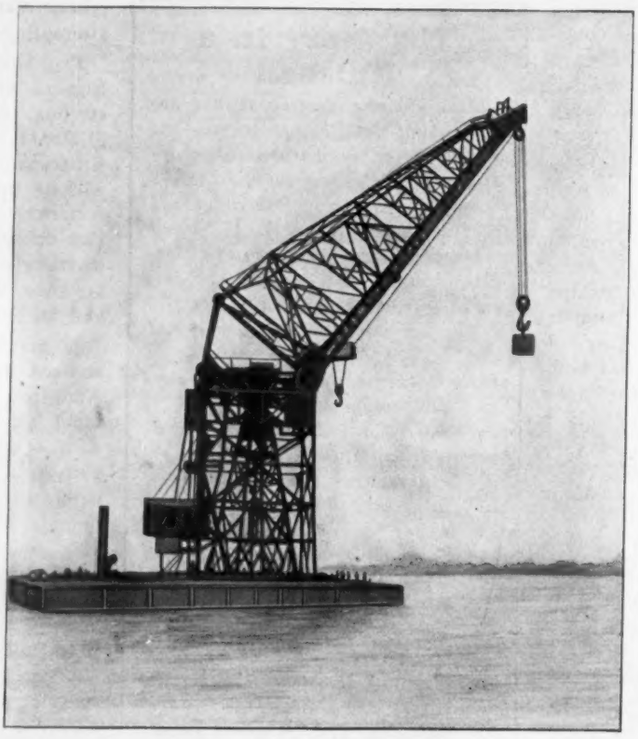
the sizes of the machinery in detail, even to the sizes of gears and shafts, without which it was stated that the proposals would be irregular. Of course, it cost a considerable sum of money to make plans of this nature, and the German bidders saved themselves large portion of this expense. They did not detail their machinery as specified and this point was waived in their favor when the award was made. The specifications called for a long list of spare parts. The German bidders omitted these in order to give a lower price, and this point also was waived. It would, at least, be interesting to know why the canal commission holds such a tender regard for foreign engineering firms that it is willing to waive many important points in the specifications covering one of its largest contracts.

The commission made an estimate itself as to what these cranes should cost and this figure was $850,000. Previous to the opening of bids, in order to be fair to all concerned, the estimate of the commission was a secret. In view of this, the fact that the German bid comes within 3½ per cent of the amount of money which the commission estimated it could spend on the job, is interesting, to say the least.

One of the important reasons given by the commission for awarding this work to Germany was the earlier delivery which was promised. Now as to the outcome of this transaction. The machines should have been completed during August, 1914. At the present time they are not finished and only one of the cranes, the Ajax, has been sufficiently completed to be tested. The Hercules is not yet in shape for a test. It remains to be seen whether the government will collect the penalty which was specified for delay in delivery. Also it should be pointed out that this delay has not been due to the war, inasmuch as the cranes were shipped prior to the outbreak of the conflict and are being completed at Panama, absolutely free from all interference of a military nature.

What happened when the Ajax was tested now is well known. It was specified that this crane should handle, in addition to the 250 tons at 62-foot reach, 100 tons at a reach of 82 feet, and to each of these loads 20 per cent should be added as a test of strength. The maximum fiber strain permitted by the specifications should have allowed a factor of safety of over 3½ with a load of 120 tons at 82 feet. As a matter of fact the Ajax collapsed with the test load of 120 tons at a reach of 81.6 feet, nearly half a foot less than the maximum called for under the test. The condition of the wreck is shown clearly in the accompanying illustration. The stress developed in the members which failed was said to be a little over one-third of what they should have withstood. No wonder the canal commission has appointed a committee to investigate.

The 100-ton weight prescribed in the test was represented by a huge block of concrete on the ends of which the exact weight in pounds were lettered. When the test on the lift of 120 tons was begun, rails were piled between supports which had been embedded in the concrete block. The block, together with the rails, had been lifted to a height of 3 or 4 feet from the ground when the boom of the crane collapsed. Parts of the steel frame which were bent and twisted will have to be replaced entirely; other parts can be used again. In view of the fact that new material cannot be obtained from Germany at present, the repairs undoubtedly will have to be fabricated in the United States, involving additional expense and delay. The damage has been estimated all the way from $120,000 to $150,000 and it is expected that from four to six months will be required to put the crane in working condition.



THE CRANE BEFORE THE ACCIDENT

If any stronger argument for the passage of a law absolutely prohibiting the purchase of supplies and equipment by the government outside of the United States is necessary, we would like to know what it is. On what grounds of public policy can this now infamous transaction be defended? What would happen in Germany, where these very cranes were fabricated, if the imperial government went outside of the fatherland for an important item of naval equipment?

It is high time indeed for the American people to wake up and realize that in many high positions in the government service we have men who are either too short-sighted or too stupid to understand the meaning of the word patriotism.

Consider also the tremendous losses that would ensue should one of these cranes fail while handling a lock gate, or other important piece of canal equipment, resulting in a traffic blockade that might not be raised for days.

William C. Redfield, secretary of commerce, in a recent interview, stated: "All that now is necessary is that American manufacturers have the vision to see and the courage to grasp the opportunities offered." We have given, above, the history of one transaction in which an American manufacturer had the vision to see and the courage to grasp. We also have detailed the results that followed. Need any more be said?

A series of booklets recently has been issued by Robert W. Hunt & Co., engineers, Chicago. The Hunt organization and its methods of operation form the subject of one booklet, which also contains a partial list of clients. Other booklets cover electrolysis, the inspection of creosoted timber, the inspection and tests of materials for highway bridges, the inspection and testing of paving brick and the inspection of cement and concrete. The latter includes the standard specifications for Portland cement which have been adopted by the American Society for Testing Materials.

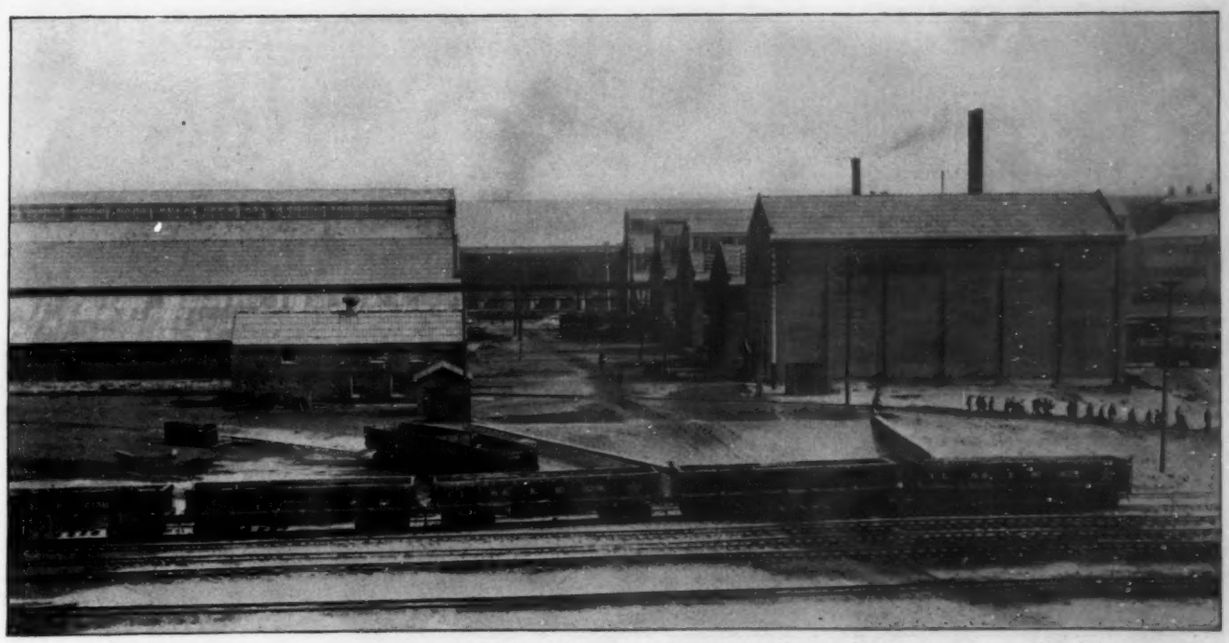


Fig. 1—Group of Repair Shop Buildings at Gary Plant of Indiana Steel Co.

For Repair Purposes at Gary

Description of the Shop Facilities of the Great Works of the Indiana Steel Co.—Extensive Tool Equipment Provided

WHAT might be termed the heart of the great Gary works of the Indiana Steel Co. is included in the group of buildings facing the main road entering the plant from Broadway, Gary's principal street. Every visitor going into the works from the general office building passes down this road between the rows of shops. These buildings were among the first erected at the Gary plant and while building was going on they were used to repair construction equipment and give needed service in many ways. They are built with steel frames, brick side walls and tile roofs and are substantial structures in every respect.

Passing down the street between the two rows of shops, a street 100 feet wide, a visitor sees on the right the pattern storage building, then the carpenter and pattern shop and next the electrical repair shop. The blacksmith shop and boiler shop complete this row. On the left a brick storage shed comes first, then a storehouse for supplies, followed by the foundry and the machine shop.

By reference to Fig. 4, it will be seen that the foundry and machine shop on one side and the boiler and blacksmith shop on the other are grouped to be served by a single crane operating in the storage yards between the buildings and crossing the street. This gives adequate communication by crane and heavy materials are transported from one shop

FIG. 2—MACHINE SHOP SHOWING HEAVY LATHES AND VENTILATING APPARATUS

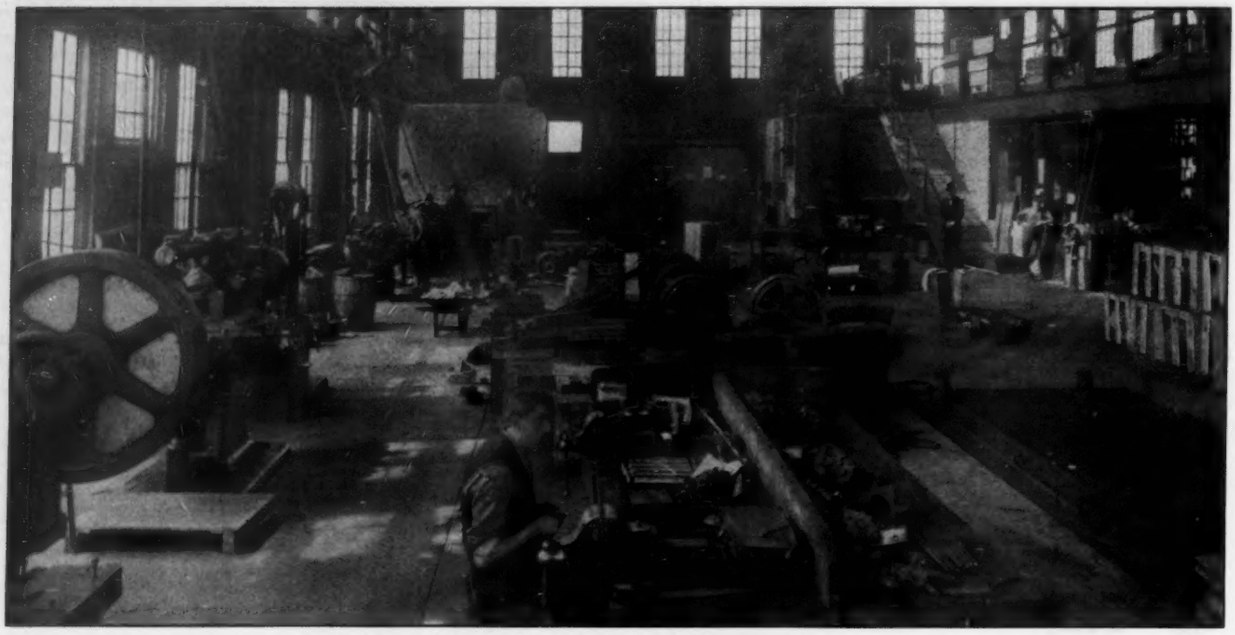


FIG. 3—ELECTRICAL REPAIR SHOP

to the other without difficulty. The rails carrying the crane are mounted on extensions to the building columns of the machine shop and foundry and on independent columns alongside the boiler and blacksmith shops. The crane is of 25 tons capacity with a 5-ton auxiliary, and has a span of 60 feet. The roll shop, an important adjunct to the shop colony, is in line with the machine shop and 400 feet distant to the west.

Extensive Facilities

The shop group is as large as many entire plants and is equipped to care for all repairs on any equipment in the works, as well as to do a great deal of new work for the various mills and other departments. Great savings of time and expense result from the thorough equipment of this department and special work can be executed under the direct supervision of plant officials.

The machine shop is the largest of the group, being 146 x 400 feet, and the foundry is next, 137 x 400 feet. The boiler shop is 132 x 160 feet, the blacksmith shop 62 x 160, the electric repair shop 62 x 160, the carpenter and pattern shop 51 x 100 feet, and pattern storage 50 x 120 feet. The roll shop is 55 x 200 feet.

In addition to the shops mentioned, there is a small repair shop at the blast furnace plant, where repairs may be made more quickly than in the main shops, and at several points in the various mills facilities are provided for expediting repairs which can be handled easily with light equipment. However, everything but the small work is handled in the central group.

The machine shop is divided into three parts, central portion 77 feet wide and two bays, one 34 feet 9 inches, and the other 35 feet wide. This shop is 46 feet 4½ inches high in the central bay from the floor to the roof trusses.

Grouping of Tools

The tools are grouped according to their uses, the heavier along the sides of the central space with the lighter in the side bays. Ample space is allowed in the center of the shop for erecting and a railroad truck permits loading direct to cars for transportation to other portions of the plant. Two Whiting cranes of 25 tons capacity

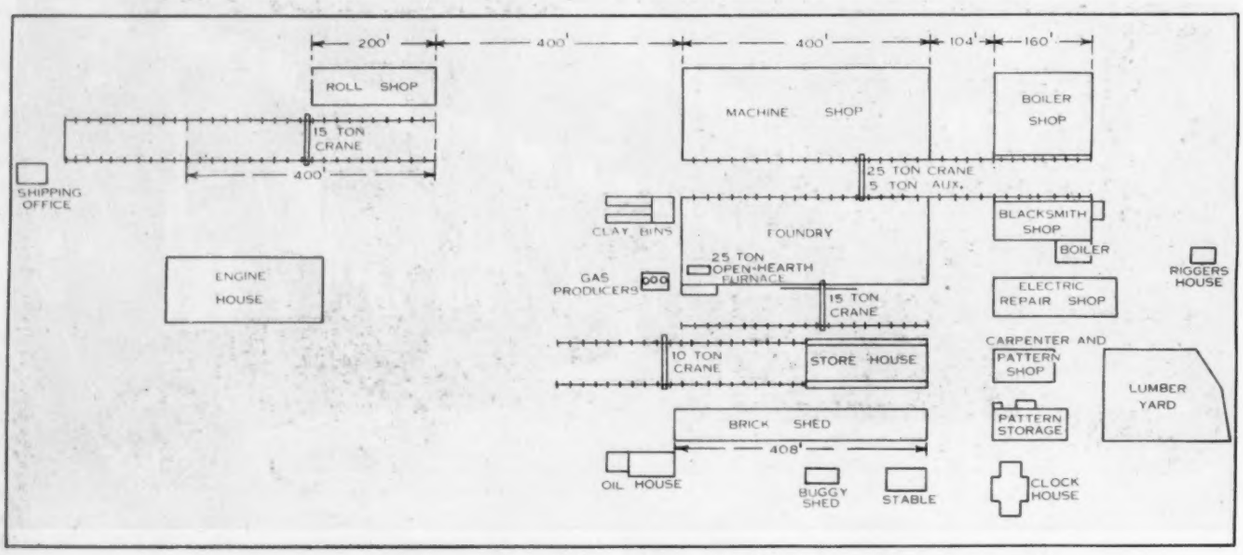


FIG. 4—PLAN OF SHOPS AT GARY

FIG. 5—CUPOLA HOUSE AND YARD CRANE

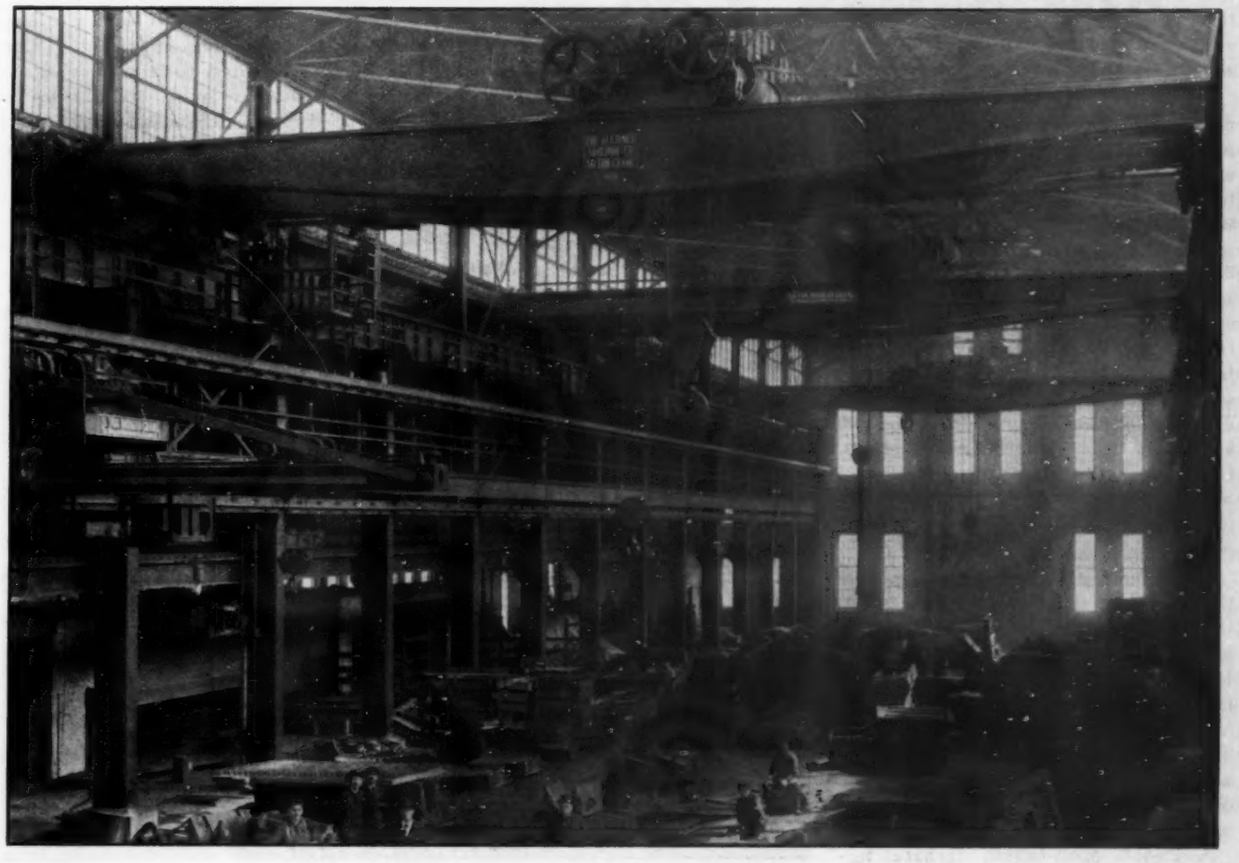


FIG. 6—THE FOUNDRY HAS EXTENSIVE CRANE EQUIPMENT

FIG. 7—GRAY IRON MELTING EQUIPMENT IN FOUNDRY

with 5-ton auxiliary hoists serve this shop.

Entering the shop at the east end, one encounters the lathes at the right of the central bay and then the heavy boring mills. On the opposite side are the planers, shapers, drill presses, keyseaters, slotting machines, axle lathes and pipe threading machines. The machines are group driven by four 72-horsepower motors through line shafts fastened to the girders of the side bays. The shop is heated and ventilated by hot air from two sets of steam coils and fans.

While the equipment does not include any tools of unusual size or power, it is exceptionally complete and well suited to the purpose. Fifteen lathes ranging from 72-inch to 10-inch swing and six planers ranging from 96 inches to 30 inches between housings, are provided. There are two boring mills, one of 16-foot and one 6-foot capacity. In addition to the foregoing, there are three horizontal boring machines, four milling machines, four turret lathes ranging from 24 to 36 inches, eight drill presses, six emery tool grinders, two slotters, four pipe threading machines and numerous keyseaters, grinding machines and smaller tools for various purposes.

The foundry is situated alongside the machine shop and is 137 x 400 feet, with the middle section, 61 feet wide, utilized as the molding floor. It is served by two 25 and 40-ton cranes, built by the Morgan Engineering Co., and one 50-ton Alliance crane. Two 5-ton Morgan wall cranes with a reach of 17 feet travel below the other cranes on the north side of the molding floor.

A 25-ton open-hearth furnace furnishes steel and two cupolas of nine and 13 tons capacity per hour supply iron. A Schwartz brass furnace of 750 pounds capacity is used for melting brass and aluminum. Four core ovens are situated in the middle of the north bay.

A feature of the foundry is the casting pit, utilized for casting rolls. This is 24 feet deep. It is lined with steel and is almost entirely below the level of the lake. It has successfully resisted the incursion of water. One portion of the pit is only 10 feet deep, allowing the shorter castings to be made without building up in the deeper portion to support the molds. All the rolls used throughout the mills can be cast in this foundry.

The boiler shop is directly opposite the machine shop and is 132 x 160 feet with a central portion 62 feet wide and two side bays 35 feet each. A 15-ton traveling crane and numerous post cranes serve the machines. Material entering at the east end goes to the shears, of which there are two, an angle shear and a straight shear, and then to the punches, of which there are three, horizontal and vertical. It next passes to the bending rolls, two sets being provided, or to the flanging presses and angle bending machines.

The central space is used for riveting and erecting and the side bays for laying out, fitting and other lighter work. An Ingersoll-Rand twin compressor, operated by a 120-horsepower Westinghouse synchronous motor, supplies compressed air for operating pneumatic tools. Boiler work proper forms a comparatively small portion of the output of the shop; a large portion of the capacity is utilized in the repair of ladles and other apparatus fabricated of plates.

The blacksmith shop completes the main group of four shops. It is equipped with four steam hammers, ranging from 1,100 to 6,000 pounds capacity, two bolt heading and two bolt threading machines, a double punch and shear, heating furnaces and forges.

Repairing electrical apparatus as well as the construction of new devices forms an important feature of the Gary shop operations, as a large portion of the motive power is furnished by electricity. The electrical repair shop is 62 x 200 feet with a gallery along one side and one end. The gallery is devoted to armature winding and similar work. The shop is equipped with eleven lathes from 54 inches to 16 inches swing, for turning commutators, shafting and stub axles. The shop also has two milling machines, a slotter, two shapers, a boring mill and a planer, while under the gallery are located a punch press, a

FIG. 8—BLACKSMITH SHOP SHOWING STEAM HAMMER

FIG. 9—BOILER AND PLATE SHOP

cold saw, several radial drills and smaller tools. No repair or construction work on the electrical equipment of the plant is too large or complicated for this shop to handle.

Apart from the main shop group is the roll and locomotive repair shop, as shown in Fig. 4. The former machines and finishes rolls for all the mills. It is 55 x 200 feet and has a storage yard 600 feet long, served by a 15-ton crane. Inside the shop is another crane of the same capacity for placing rolls in the various machines. The equipment of this shop includes two 60-inch, four 44-inch, one 42-inch and three 34-inch roll lathes and a 54-inch

(*Continued on page 304b*)

Heavy Cutting on a Boring Mill

BY ALBERT A DOWD

CYLINDRICAL work which is to be machined in quantities, is generally forged or cast in such shape that it requires the removal of a minimum amount of stock during the machining processes, both because of the loss in time when removing large quantities of metal and also because "scrap" metal is of little value. There are occasional instances, however, when economy in producing the piece in the rough state takes precedence over the cost of machining. When a large piece of steel work is of such a nature that it cannot be drop-forged readily, it is sometimes spun or rolled up from a billet of steel, a special machine being used to work the piece into shape while hot. A great deal depends on the form of the work and the size of the hole which passes through it.

On work which is rolled into shape from a hot billet a hole from four to five inches in diameter may be punched, leaving the balance of the metal to be removed by machining. When the finished hole therefore is seven or eight inches in diameter, it will be seen that the amount of stock to be taken out is considerable. In

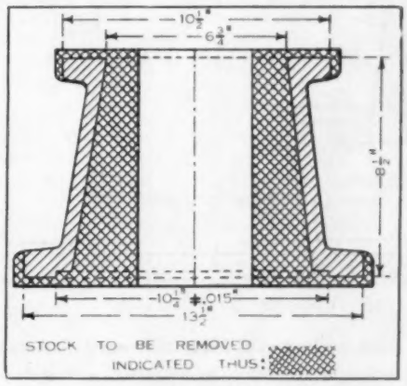


FIG. 1 — SECTION OF CYLINDRICAL PIECE SHOWING AMOUNT OF STOCK TO BE REMOVED

order to machine work of this character rapidly and economically, the tooling must receive the most careful attention. The method of clamping the work to the machine is also important, for the removal of a large quantity of stock necessitates an exceptionally rigid holding device, in order that the pressure of the cut may not pull the piece out of the fixture.

The piece shown in Fig. 1 is a rolled forging of 0.020 per cent carbon steel with a 5-inch hole punched through it. The amount of stock to be removed is clearly shown in the illustration, and it should be noted that great accuracy is not required at any point except the recess, and even this portion has a tolerance of ± 0.015 inch. On account of the heavy cuts necessary and the amount of stock to be removed, a vertical boring mill having two swivel heads was selected as the most suitable machine for the work.

The work *A*, Fig. 2, is set up in the jaws *C* which are keyed at *D* to the sub-jaws in the table chuck, and the lower face of the flange rests on the steel buttons *B* which are inserted in the screw holes of the jaws, thus giving the piece a three-point support on the rough surface of the flange. Although the chuck in the table is a powerful one of the geared scroll type, the amount of surface which is presented to the jaws was insufficient to hold the work securely, so that supplementary clamps *Q* were brought into use in connection with the jaws, the tee-bolts *R* entering slots in the table quite close to them and a block *S* being used to support

the tail of the clamp. After the work had been tightly gripped by the jaws, the clamps drew the flange down firmly on the hardened steel buttons, thus giving exceptional holding power.

It was desired to remove as much of the excess stock in the interior of the forging as possible in one cut, and a special bar *B* was designed for this purpose. This bar was a steel forging 0.040 per cent carbon, with a stem *D* which entered the hole in the ram, the groove *E* being used for the locating pin. The flanged portion of the bar was drawn up against the face of the ram and bolted in place at *C'*, as shown in the illustration. Owing to the heavy cutting, the regular method of binding the bar was not considered sufficient, and the flange was provided to give greater security. The bar was provided with two tools *J* and *M*, which were so arranged that both ends of each tool cut out the stock progressively in the form of a series of steps. The end *L* of the tool *M*, for instance, is set out from the center of the bar ¼ inch further than the other end, and its beveled cutting face is 1/16 inch behind it. The tool *J* is set at right angles to the first and is arranged in a similar manner so that one end protrudes further from the center of the bar than the other. It will be noted that this method of setting exercises a self-centering tendency and balances the cut. Tools are held in any desired position by the setscrews *N* and *K*, two of which are set out beyond the others so that a wrench can be applied to better advantage.

On account of interferences between the two heads it was found necessary to swing the left hand head over at an angle to face the flange and rough off the rim. A special tool holder *F* was built to give additional support to the facing tool *G*, and in this connection it should be noted that the shape of the tool is such that any vibration or spring which takes place during the cutting action, tends to throw the cutting edge away from the work and not into it, thereby minimizing the probability of chatter. The front edge of the tool is ground square so that it can be used to rough the rim by adjusting the left hand head to another position and dropping the ram until the tool takes the position *H* shown by the dotted line. Nearly 40 pounds of metal were removed by this method in 11 minutes, including the setting up and removal of the work from the boring mill table.

A set of special jaws *D*, Fig. 3, is used to hold the piece during the second setting, these jaws being of soft steel, keyed to the sub-jaws of the table at *H*, and bored out at *J* to fit the outside of the previously turned flange. In addition to the jaws, three clamps *E* are used to secure the work more firmly, the screws *F* being of the tee-variety as in the first setting, and the blocks *G* acting as supports for the end of the clamps. In this setting the right hand head is swiveled to an angle corresponding with the inside taper of the work, and a special bar *K* fits the ram and is held in place by the regular binder screws and the groove *L*, by which location in a vertical plane is assured. The lower end of the bar is broached out to receive the square tool *M*, which is held in place by the two set screws *N*. Attention is called to the fact that this tool is made somewhat long in order to provide for upkeep. On account of the amount of stock to remove from the large end of the piece, two cuts were required with this bar, the head being set over after the first cut a sufficient amount to allow the removal of the balance of the material. The tool is shown in position part way through the first of these cuts, removing the stock, *B*.

The left hand head uses the same tool holder *P* as that shown in the first setting, the shank *Q* entering the hole in the ram and being secured therein by the binder screws. The tool *O* is used to face the flange and rough out the recess, and it is set in the holder

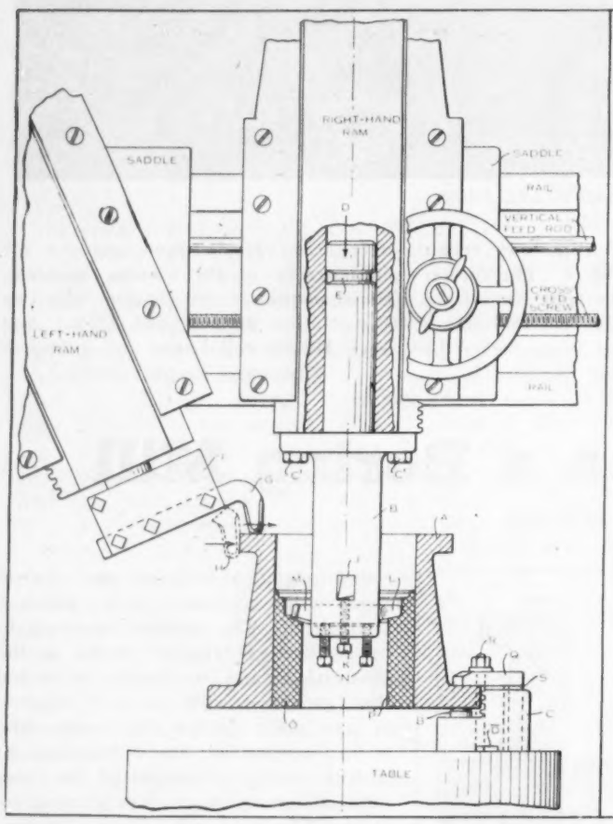


FIG. 2—ARRANGEMENT OF WORK AND TOOLS FOR FIRST SETTING

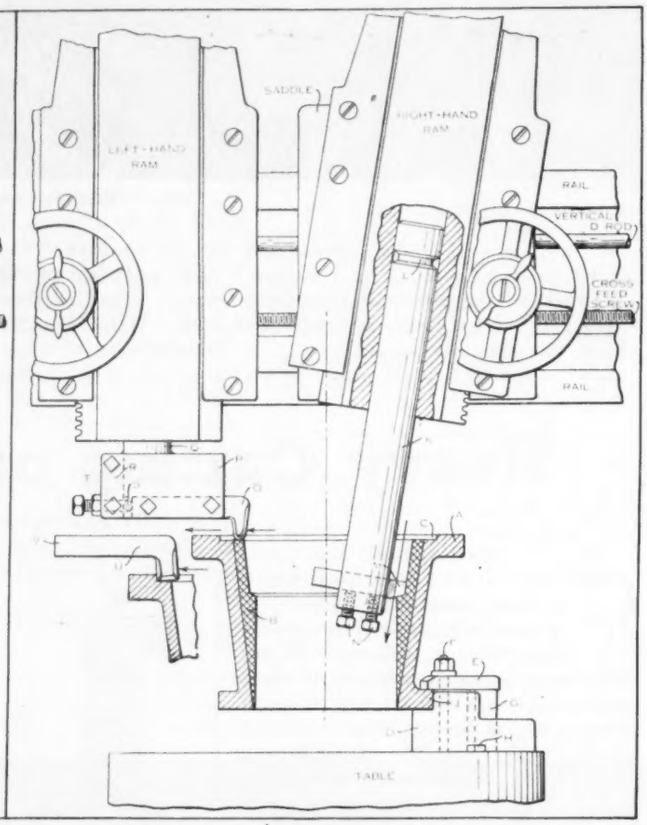


FIG. 3—ARRANGEMENT OF WORK AND TOOLS FOR SECOND SETTING

in such a way that the end brings up against the screw *S*, which acts as a stop.

The block *R* is held in place in the tool holder by the regular screws shown, and the screw *S* passes through it and is secured by the check nut *T*, which permits adjustment. After the rough facing has been done, the tool *O* is removed and tool *U* substituted for it, the end *V* bringing up against the stop screw, so that very little time is lost in changing from one tool to the other, and the same position is assured each time. The time required for the second setting was 16 minutes, including the setting up and removal of the work from the table of the boring mill.

The American Steam Gauge & Valve Mfg. Co., Boston, has issued an interesting compilation of data on steam traps, a feature of which is a number of tables showing the capacities of traps of various sizes operating under steam pressures ranging from one to 250 pounds per square inch. Steam trap formulae also are included, together with suggestions on drawing up specifications for traps. In these suggestions it is pointed out that it is inadvisable to specify traps by the size of the pipe connections, inasmuch as the capacity of the trap depends on the size of the discharge orifice rather than on that of the pipes leading to and from the trap.

Sparks From the Grinding Wheel

By H. O. Tair

Problems of industrial management were solved by the Egyptians 6,000 years ago—they discovered the science of management. I mention this merely as an antiquity. Today antiques are usually on view in the museums, but now and then you'll visit a machine shop where —— What is meant is that it won't do to holler low cost of production in the office if the machine shop is in the clutch of the Egyptians.

* * *

For his field alone, an automobile maker predicts a half-billion-dollar business for 1915. He has the punch behind the prediction, too; he believes in prosperity and is shouting it from the housetops. But wait until you hear the boom of the iron trade howitzers!

* * *

Isn't it a bit hypocritical for an employer to boast, "I have done a great deal for my employes?" He knows in his heart that he simply made conditions favorable for profitable work.

* * *

A subject of popular discussion is the "largest" this or that. Let's scrap it. We are mainly interested in the largest prices we can get for our pig iron, structural material, machinery, tin plate—well, the rest of the list can be found under the heading, "Where to Buy". The "largest" and most prosperous year will suit us.

* * *

Don't reckon the house bill to prohibit shipments to belligerents will be discussed at the Detroit convention of the National Brick Manufacturers' Association. Gone are the days when a pile of brick invited a belligerent discussion. And "scrap" dealers are still holding firm.

* * *

These times of high cost of idleness can be mightily improved if our young men will submit to "some shop grease and some pay and prospects" rather than to sit idly in the market place waiting for a flossy job with little pay and no prospects. The manly young man will see this; let's ding it in the ears of everybody.

* * *

A life insurance policy is a fine means of spreading contentment among the employes—a "safety first". Old man Faithful is coming to his own. Besides, what his wife and kiddies will say of you mere money can't buy.

* * *

One busy office manager has a miniature quilt on his desk, and when his eyes tire from the white paper he rests his gaze on the quilt. Remember the quilt you pulled over your neb in those wintry nights of your boyhood when the water pitcher was frozen over and the temperature was down about three points below the present price of hard bars. Sure you do!

* * *

The stamp and die makers report that the market for the "Made in America" stamp is weak and inactive. The time has come when, having discussed, considered and investigated, we should act—

"Act! for in action are wisdom and glory,
Fame, immortality—these are its crown.
Wouldst thou illumine the tablets of story?
Build on achievements thy dome of renown!"

* * *

"French Poet Scorns Bombs"—Headline. Of a verity, the average cold-rolled and twisted poet would even scorn the tariff protection on tin plate!

* * *

The story of iron and steel will be told "from the time the ore is mined until it emerges in its finished form" by the "movie" at the Panama-Pacific Exposition. Here's hoping that by then, the shop and foundry films will not "register gloom", but will interpose with the words: "This busy scene typifies the activity throughout the United States!"

* * *

Does the fair manipulator of the typewriter in your office object to being called a "stenographer"? An Oklahoma lady does; says she's an "amanuensis". Bet an iron foundry against an eye bolt she can't spell it (this item was NOT dictated!).

* * *

Scarcity of labor? Even with a 45 per cent decrease, there was an influx of 573,575 aliens to this country during the past year. Where else is there an outlet for Europe's surplus population?

* * *

Have you a little facade in your home? Well, you've just missed getting one from your Uncle Sam. It was recently torn from the front of the assay office in Wall street, New York, and Uncle, first off, wanted to find some kind family that would give it a good home. Of course it was snapped up—probably by the man who wanted to boast that he got something out of Wall street for nothing.

* * *

Wouldn't like to wish any more hard luck on the business calamity howler than to hope that, in the near future, he will be as lonesome as the janitor of the Peace Palace at the Hague.

* * *

Now that the dear public has learned that the eastern railroads have "$30,000,000 applicable for purchases", will Upkeep, Maintenance & Co. fail for lack of employment? Nobody home! The railroads ought to be allowed to charge for pesterin'.

* * *

Back in 1815 the parcel post was predicted, and three years later plans were described for the Cape Cod canal. Now we have 'em both. What an impulsive people we are! Will the senate kindly step up on the platform and announce to the eager audience just when that thirty millions for ocean carriers is to be expended to aid our afflicted commerce, and what good it will do? We want to know.

A Precision Grinding Machine

Description of a New Tool Provided With Belt or Motor Drive and an Interesting Change Gear Mechanism

A NEW self-contained grinding machine recently has been developed by the Modern Tool Co., Erie, Pa. Its details are shown in the accompanying illustrations. It is arranged for single pulley belt drive or direct motor connection. The machine was designed primarily for rapidly finishing parts from the rough to close limits with self-contained motor drive. In developing this machine the distinctive features of its predecessors have been retained, and a number of improvements added, all of which are said to tend to increase the ease and rapidity with which the machine operates.

A single unit change-speed mechanism has been provided through which both work speeds and table feeds are obtained. This consists of three series of gears contained in a case and running in a bath of oil. Through them the 12 work speeds and six table feeds are obtained, giving a wide range of combinations. The gear case is located on the base of the machine and the different speeds and feeds are obtained by moving a lever located on the front to the speed desired, as indicated on a dial. Fig. 2 shows a front view of the 12 x 24 inch plain machine.

The arrangement of gears by which these speed and feed changes are obtained is shown in Fig. 4. The gearbox proper consists of two parts, the lower one *M* forming an oil tight container for the lubricant and serving as the support for the three shafts. The upper part *N* carries the two shafts and gears, for doubling the work speeds. The power is supplied from the main drive shaft on the back of the machine by belt to pulley *J*.

Change Speed Device

The change speed device consists of three series of gears, *A*, *B* and *C*, Fig. 6. These gears which are journaled in a case, *M-N*, are at all times in mesh, and run at constant speed. The center series of gears *A* are the drivers, and on the end of the shaft is the driving pulley *J*. The series of gears *B* controls the table feeds, and the series *C* controls the work speeds. Gear *D* meshes with *E*, shown in the top of the case. The jaw clutch *K* engages the gear *F*, giving six changes of work speeds, and six additional changes of speeds are obtained by clutch *K* engaging the gear *H*. Clutch *K* is keyed to the shaft *I*, and on this shaft the gears *F* and *H* are mounted loosely.

All gears run at a constant speed. The change gears are carried on the shaft *O*, shown in Fig. 1. In the hub of each gear is keyed a hardened and ground ball race ring, *Q*. In the shaft, directly in the center of each gear is a steel ball *P*, and through the shaft runs a flat cam *S*. To change the work or table speed, the lever on the front of the machine is moved to the speed desired, which in turn moves the flat cam *S* under the proper gear and raises the steel ball *P* half way through the shaft and into the ball race *Q* in this gear. In Fig. 1 the flat cam *S* is shown attached to its shifting ring and yoke *X*.

With this style clutch it is possible to go from high to low, or any intermediate speed without stopping the machine, as all the gears run at constant speed and are always in mesh. While the different changes of work speeds are obtained through the gear box, power is transmitted to the head through a belt.

Special attention is called to the method of aligning the head and foot stocks. They are fitted on V and flat ways which are said to keep them in alignment wherever they may be placed, and the support is directly under the centers, there being no overhang.

The stand carrying the wheel slides on V and flat ways and has a safety gib. It has sufficient movement to grind work to the full capacity of the machine with a full size wheel and will allow a wheel with 5-inch hole to be worn to 9 inches diameter.

The wheel spindle is 3¼ inches in diameter, 32¼ inches long, with 8¼-inch bearings at each end. The machine is regularly fitted with a wheel 18 x 2 inches, but a larger diameter or any

(*Continued on page 287*)

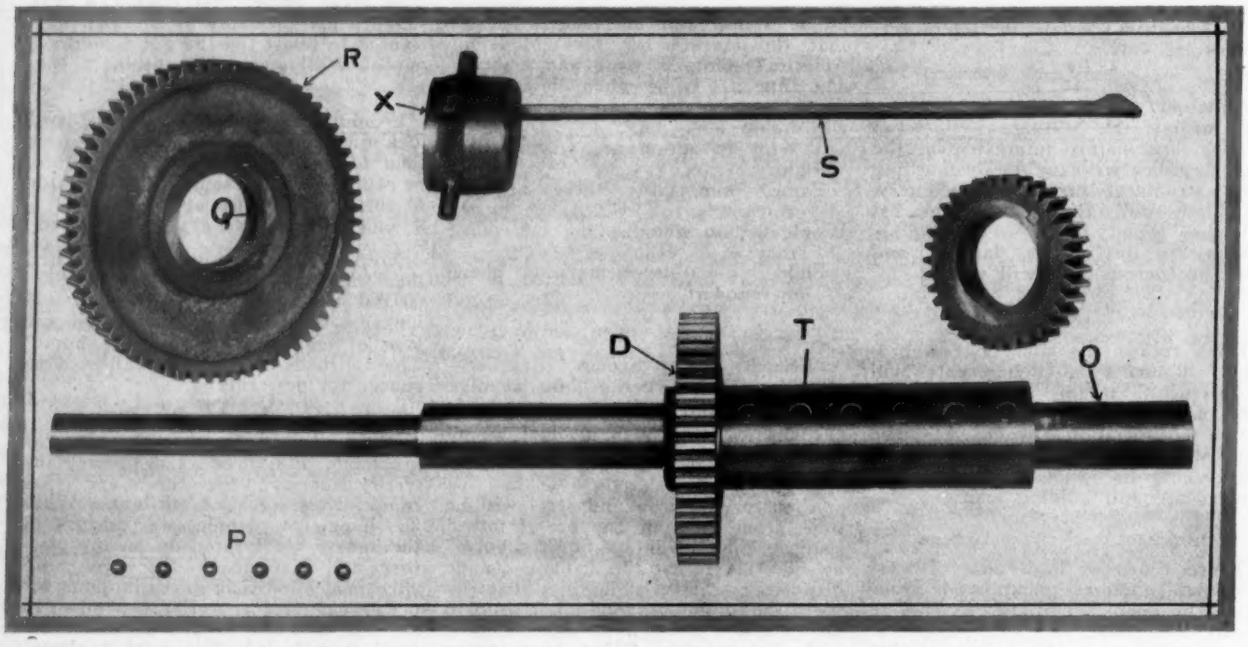


FIG. 1—DETAILS OF BALL DRIVE CLUTCH CONSTRUCTION IN GEAR BOX

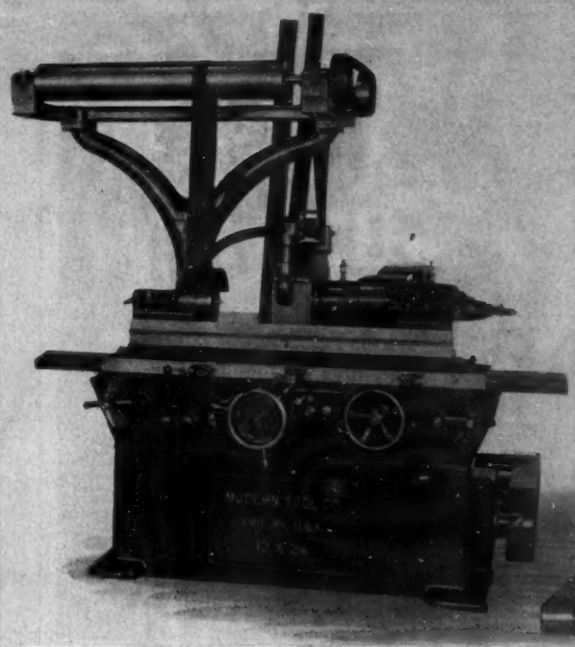


Fig. 2—Front View of Machine

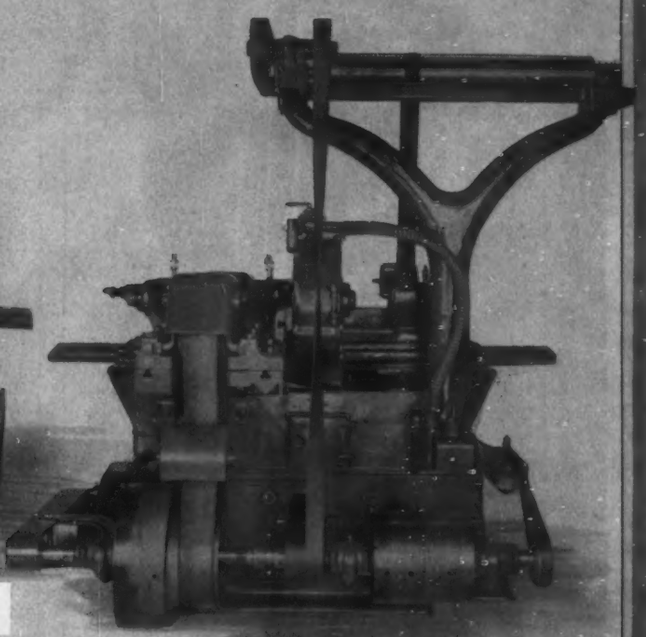


Fig. 3—Rear View of Machine

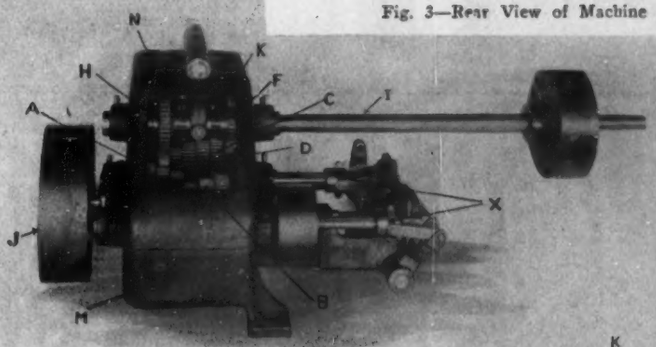


Fig. 4—Gear Box Assembly

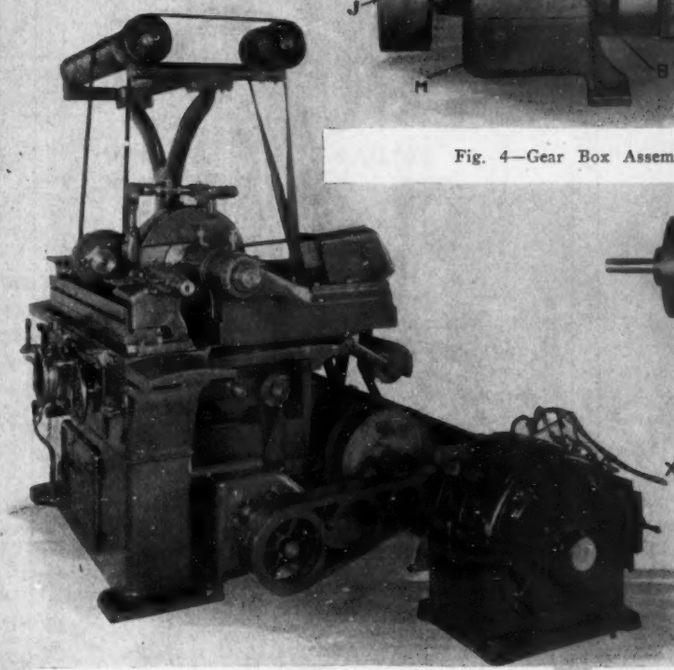


Fig. 5—End View of Machine

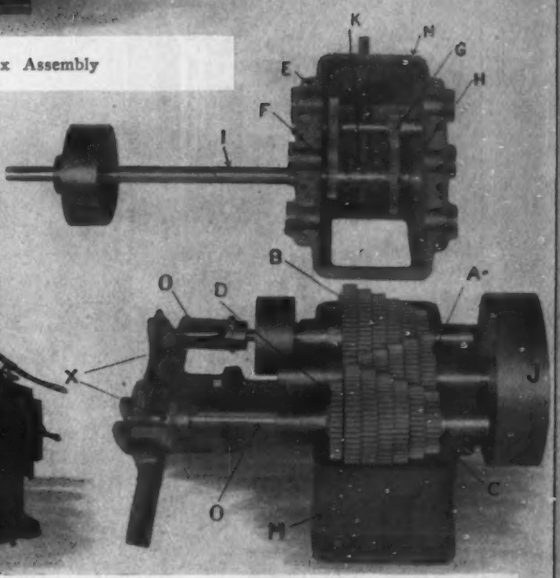
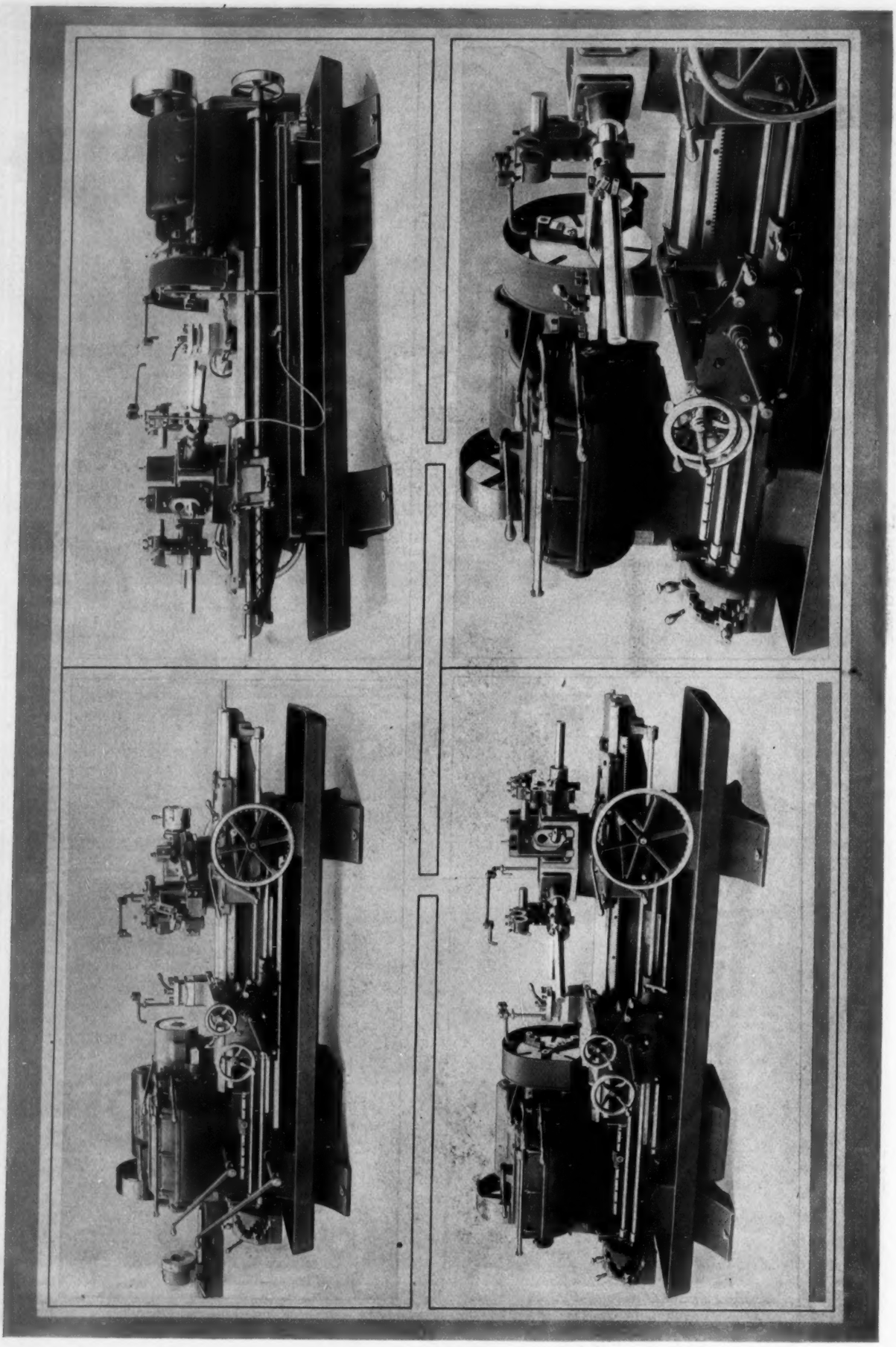


Fig. 6—Details of Gear Box



NEW DESIGN OF UNIVERSAL HOLLOW-HEXAGON TURRET LATHE

A Precision Grinding Machine

(*Continued from page* 284)

width face up to 6 inches can be used. The wheel spindle is driven by a long 6-inch belt running on large diameter pulleys and has two speeds.

The main drive shaft is located on the back of the machine, Fig. 3, and runs at constant speed. It is furnished with a tight and loose pulley when line shaft drive is used, or may be direct connected to constant speed motor, Fig. 5. The automatic cross feed operates at each reversal of the table, or if desired at one end only, and may be adjusted to feed for a reduction of 0.0005 inch minimum to 0.005 inch maximum. It is automatically thrown out when work is down to size. It is also provided with a positive stop for bringing the wheel to a predetermined point when fed by hand. The machine also can be equipped with automatic cross feed for feeding the wheel when the table is stationary.

The cross feed hand wheel is graduated in 0.0005 inch, in plain view of the operator. The automatic cross feed is adjusted by the movement of a lever to the point desired, as indicated on a graduated plate, and may be instantly changed to any feed while the machine is in operation. The control of the machine is from the front.

Turret Lathe of Improved Design

A UNIVERSAL hollow-hexagon turret lathe of improved design has been developed recently by the Warner & Swasey Co., Cleveland. The most important change made in the new type is the complete re-designing of the head, all of the gears of which run in oil. Other features of interest are the larger working range, increased power of the head, with a corresponding increase in the strength of the bed and two tool-carrying units, and larger tools.

The increase in capacity has been attained without materially increasing the size and operating dimensions of the machine. The automatic chuck takes stock up to 3½ inches, while the length turned has been increased to 40 inches. The swing over the cross slide carriage is 17¼ inches, the maximum swing of the machine having been increased to 21½ inches.

With a 5-inch belt running on a 16-inch pulley the head is capable of transmitting 14 horsepower, with a large overload factor. This power is required only when taking several cuts simultaneously in heavy steel castings or forgings. The tools have been re-designed to conform with the increased power of the lathe. Steady lubrication is insured through the splash system.

The pan has been lowered to give increased space for chips and to afford easy access to the parts directly over the pan. The legs are of the semi-box type and have a wide spread. The turnstile which was formerly used to operate the turret saddle has been replaced by a large hand wheel.

While the turret and carriage are power-operated simultaneously, the feeds are independent. This arrangement permits two distinct operations at one time, for example, boring with the turret while the carriage is facing or recessing and cutting off. Eleven tools may be placed in operation with one set-up.

The lathe has 12 spindle speeds, both forward and reverse, with 10 feed changes in each direction for both carriage and turret. Feed changes are controlled by the feed box at the head end. Feeds ranging from 10 to 218 can be produced. The spindle speeds range in geometrical progression from 8 to 250.

The head is cast solid with the bed and is of the single-pulley type. It may be bolted directly to line shafting or to a constant speed motor. Four views of the lathe are shown on the facing page.

High Pressure Reducing Valve

The International Oxygen Co., 115 Broadway, New York, has developed a high pressure valve for gas cylinders which, it is said, is free from leaks. In valves of this character, freedom from leakage is very essential, since, owing to the high pressure at which the gases are stored in the cylinders, a loss of as much as 25 per cent of the cylinder contents may easily occur if the valve is not tight. The valve developed by the International Oxygen Co., it is said, can be used for pressure up to 2,500 pounds per square inch. It is made of metal throughout, no packing being used in any part. The body is forged tobin bronze, while the other parts are made of suitable non-corrosive metals. A diaphragm takes the place of packing material. No stuffing box is used. The diaphragm is slightly concave and normally is set a sufficient distance away from the valve seat to form a full opening. It is not necessary, therefore, for the gas to raise the diaphragm. It is claimed that all of the gas in the cylinder can be used, down to atmospheric pressure. The valve also is fitted with a safety plug, which has been passed on by the bureau of explosives of the interstate commerce commission. The plug is filled with a fusible metal which melts at or below the boiling point of water. The plug, it is said, will not blow out when submitted to the direct rays of the sun or other atmospheric influence, but it will blow out when placed in a fire, before the expansion of the gas can do any damage.

Pres. Farrell Will Speak

The annual banquet of the Engineers' Society of Western Pennsylvania will be held, Feb. 8, at Hotel Schenley, Pittsburgh. James A. Farrell, president of the United States Steel Corporation, will be principal speaker. W. F. M. Goss, past president of the American Society of Mechanical Engineers, dean of the college of engineering, University of Illinois, and chief engineer of the project for the electrification of railway terminals in Chicago, and Rear Admiral Victor Blue, will give short talks. Sumner B. Ely, vice president of the Chester B. Albree Iron Works, Pittsburgh, will be toastmaster.

Donald Returns

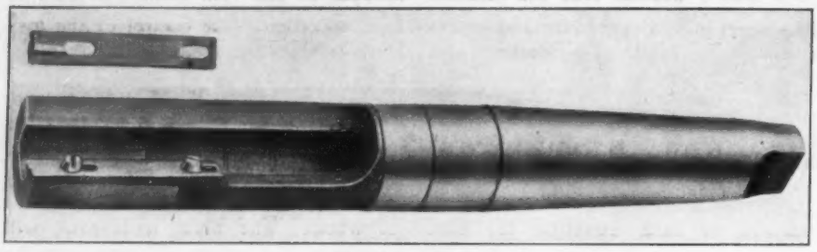
Percy G. Donald, of the firm of Bronson, Drew & Clydesdale, Ltd., London, who spent several weeks in this country shortly after the outbreak of the European war, has returned to the United States to buy additional material for shipment to England and European countries. He spent a few days in the Birmingham, Ala., district, and consulted manufacturers in the Pittsburgh territory.

Mr. Donald is negotiating for zinc, cut nails, wire, steel tubes, expanded metal, piano rest pins, tin plate, shovels, wire netting, screws, nuts, bolts, tacks, white lead and window glass.

Mills Resume. — The Pittsburgh works of the American Sheet & Tin Plate Co., Pittsburgh, at New Kensington, Pa., have resumed operations.

New Core Drill

A new core drill for extracting test coupons for physical tests, recently has been designed by the Triangular Tool Co., Erie, Pa., and is shown in the accompanying illustration. This drill, it is claimed, will core out a piece in 20 to 25 minutes from all grades of steel without redrawing the tool to clean out the chips. The core produced is 5½ inches long and 13/16-inch in diameter, leaving 1/16-inch on the diameter for finishing. The drill holder is made of chrome vanadium steel and is heat treated.



NEW CORE DRILL

The drill recently has been equipped with an oil hole for bringing the cutting compound to the cutting edge of the drill. Production time of the drill with oil hole is said to be reduced from 20 minutes to less than 10 minutes.

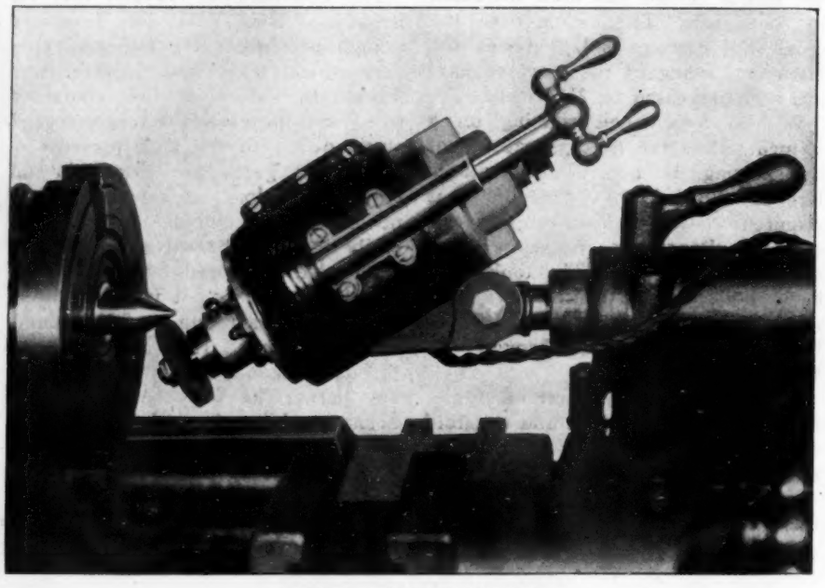
Lathe Center Grinder

The Neil & Smith Electric Tool Co., Cincinnati, has put upon the market a portable center grinder which is designed to maintain accuracy and to keep all lathe centers throughout a manufacturing plant to a uniform angle of 60 degrees. It is said the accuracy of the work is not dependent upon the operator, as this is governed by the grinder itself. The method used to grind lathe centers is simple. The grinder is supplied with a taper shank, which is inserted in the tail stock of the lathe in place of its regular center. The spindle of the grinder is now at the proper angle to grind 60 degrees. The center of the spindle in this grinder and the center of the taper shank are in one straight line, the position of this line being controlled by the accuracy of the spindle in the tail stock. The grinder is interchangeable for lathes of different sizes. The speed is 6,000 revolutions per minute. The size of the wheel is ¼ x 2½ inches. The weight of the grinder is 18 pounds, and the over-all dimensions are 5 x 11 inches.

Bid on Lock and Dam.—Bids for the construction of the $1,000,000 lock and dam to be located three miles above Maysville, Ky., in the Ohio river were opened last week by Col. Henry Jervey, in charge of Cincinnati district No. 1, corps of United States engineers. The lowest bid was that of the Bates & Rogers Construction Co., of Chicago, which is at present constructing a dam near the proposed site of the new one. It was for $972,544.06, and to it will be added about $200,000 for equipment of the dam.

Study of the Malleable Furnace

The Harbison-Walker Refractories Co. has issued the third booklet in its series covering important iron and steel processes. The new volume is entitled "A Study of the Malleable Furnace". The same high standard which characterized the two preceding volumes, "A Study of the Blast Furnace" and "A Study of the Open-Hearth", is maintained. No effort is made to present an exhaustive technical treatise, but simply to furnish an accurate and comprehensive account of malleable practice written in simple language for non-technical readers. The chapter on the microstructure of malleable cast-iron deserves particular commendation. It is one of a very few simple and clear explanations of the characteristics of the iron-carbon alloys, some knowledge of which is necessary to any one at the present time who pretends to even a superficial acquaintance with the metallurgy of iron and steel. The booklet contains 113 pages and the character of the printing and press work could hardly be improved.



LATHE CENTER GRINDER

Working for Consolidation

Definite steps toward the consolidation of the Wheeling Steel & Iron Co., Wheeling, W. Va., and La Belle Iron Works, Steubenville, O., were taken last week by the boards of directors of the two concerns. Isaac M. Scott, president; C. R. Hubbard, chairman of the board; E. C. Ewing and B. W. Peterson, were appointed by the Wheeling company to confer with Alexander Glass, W. H. Hearne and George Grier, who were named to represent La Belle interests. The proposed merger is a revival of the plan discussed at frequent intervals the last few years.

The Reeves Mfg. Co., Canal Dover, O., has purchased the entire business of the Ohio Stove Pipe & Mfg. Co., New Philadelphia, O., including the patents, machinery, manufacturing stock and good will. The New Philadelphia company has been a leading maker of stove pipe and elbows and its addition will greatly increase the already extensive line of stove pipe and albows of the Reeves Mfg. Co.

Foundation Rests on Broad Ideas

Ambrose Swasey Makes Initial Donation—Ceremonies Attended by Many Eminent Engineers—High Tributes to the Donor

Ambrose Swasey, scientist, engineer and manufacturer, is the donor of the initial fund for The Engineering Foundation, dedicated to the highest achievements of the engineering profession and formally inaugurated at a largely attended meeting of engineers and scientific men at the Engineering Societies building at New York City, Wednesday evening, Jan. 27. Previous announcement of the decision to establish the foundation had not revealed the name of its first benefactor, and it remained for Gano Dunn, president of the United Engineering Society and past president of the American Institute of Electrical Engineers, to make the announcement. Mr. Swasey's gift to the fund is $200,000. As far as known, this is the first time a foundation has been dedicated exclusively to engineering advancement.

The New Foundation

The Engineering Foundation, inaugurated by the United Engineering Society, is the name given to a fund to be "devoted to the advancement of the Engineering Arts and Sciences in all their branches, to the greatest good of the engineering profession and to benefit mankind.

The administration of this fund will be entrusted to the Engineering Foundation Board, elected by the trustees of the United Engineering Society and composed of eleven members, nine from the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, and two members chosen at large.

The ceremonies attending the inauguration of the foundation were of a notable character and were participated in by eminent men in all lines of engineering endeavor. Representatives of the three societies—the American Society of Mechanical Engineers, the American Institute of Mining Engineers and the American Institute of Electrical Engineers, forming the United Engineering Society, and of the American Society of Civil Engineers, which also will assist in the administration of the Foundation, surrounded Mr. Dunn when he formally accepted Mr. Swasey's benefaction.

Mr. Dunn, in his address, reviewed the history of the Engineering Societies building, the formation of the United Engineering Society and the purposes of the Engineering Foundation. The United Engineering Society, he said, is a creation for the purpose of enabling three of the great engineering societies, the American Society of Mechanical Engineers, the American Institute of Mining Engineers and the American Institute of Electrical Engineers, to do jointly more than they could do separately. It is a corporation which holds in trust the property on which the Engineering Societies' building is located, the building itself and its contents. The property and its contents were contributed by the founder societies and the building by Andrew Carnegie.

Reviews Engineering Organization.

The interesting fact was pointed out that the celebration of the inauguration of the Engineering Foundation was held almost exactly ten years from the date of the first meeting of the United Engineering Society, so that the event was partly a decennial. The charter of the United Engineering Society contained among the other paragraphs describing its powers the following: "To take real and personal property by grant, devise or bequest, and use, maintain, occupy, lease, mortgage and convey the same." It was in the minds of the men who drafted this document that the time would come when the usefulness of the United Engineering Society would extend far beyond a corporation for owning and administering the building. "But," said the speaker, "ten years went by before that provision was made use of, and tonight we are together because a distinguished engineer, a man of marked intellectual power, a man of marked personality, has felt in his heart that he wanted to do what would most benefit not only the engineering profession but mankind, and felt that through the agency of the United Engineering Society it could be done."

"We have foundations of many kinds.....for philanthropy, for civic betterment; foundations for many noble purposes, seem to characterize American public life. But as yet we have to hear of a foundation in engineering. At last our turn has come, at last the human element is recognized among engineers in benefaction, and at last engineering is included among those human activities which it is felt are sufficiently important to promote."

Mr. Dunn explained that the trustees of the United Engineering Society felt the foundation could be best administered if in the hands of a board separate from their own, and that the work never could be successful or representative of the whole field of engineering unless it included not only the three national engineering societies which constitute the United Engineering Society of Civil Engineers as well. "The structure of the Engineering Foundation, therefore, was so arranged that it should be managed by a board of 11 members, of which the president of the United Engineering Society should be ex-officio one, two members from each of the founder societies, two from the American Society of Civil Engineers and two from the world at large. By providing for outside members the trustees hoped to introduce into the foundation a diverse element and a point of view that would prevent the board from becoming narrow, and would likewise inspire new ideas."

AMBROSE SWASEY

A letter was read from Charles

Warren Hunt, secretary of the American Society of Civil Engineers, accepting the proposal that that society co-operate in the administration of the foundation.

Mr. Swasey's Letter.

Mr. Dunn then presented the letter from Mr. Swasey, accepting the plan of organization and administration of the foundation and tendering his donation.

Mr. Swasey paid a tribute to the engineer as the benefactor of mankind when he responded briefly to the call of the chairman.

"I would indeed be accounted as inhuman if I did not appreciate the cordial manner in which you have received this information at this time, and I know it comes from your hearts and I thank you with all my heart," he said.

"I also know that in this expression you show your appreciation of what has been accomplished by these men, these engineers of the United Engineering Society—the work which they have done in planning and in bringing about this foundation in taking upon ourselves the responsibility of the work of the organization and of carrying it on that I am sure you all express that in your appreciation as well.

"It is a very simple matter to throw a few shovels full of coal under the boiler. We must have a fire if we must have power. It is all very creditable, important and, of course, we know, necessary. But to the engineers who designed the boiler and the engine and who so proportioned them and so correlated them that the products of combustion can be used to greater advantage than ever before for the benefit of mankind, to these engineers the great credit belongs and I want to say to you, friends, I know you all agree with me that these men, these engineers, who have planned and who have constructed and taught, have set in motion the great engine of science, to them cannot be given too much credit, too much glory for what they have done in this effort, which we are sure will prove for the advancement and uplifting of humanity."

An Honorable Career

Ambrose Swasey, as a member of the firm of Warner & Swasey, of Cleveland, foremost builders of telescopes in the world and prominent manufacturers of machine tools, is known widely in engineering and scientific circles. The telescopes designed and built by this firm are distributed through many countries and have given it world-wide reputation. Among the instruments which it has designed, are the famous Lick, Yerkes and the Naval Observatory telescopes in this country, and the 72-inch reflecting telescope for the Canadian government. In the development of these telescopes and other astronomical instruments, as well as precision machinery of various kinds, which have involved constantly increasing mechanical problems, Mr. Swasey individually or in collaboration with others, has been the inventor of numerous kinds of delicate apparatus and equipment. His interest in promoting scientific education and the advancement of his profession at all times has been deep and constructive. Among such gifts by him are an observatory to Denison University, Granville, O.; Science building for the University of Nanking; and the Y. M. C. A. building for the Canton Christian college in China.

Mr. Swasey was born in Exeter, N. H., Dec. 19, 1846. His ancestors were of early New England stock. He began the machinist trade at the age of 18 and in 1870, in company with his present partner, Worcester R. Warner, entered the employ of the Pratt & Whitney Co., at Hartford, Conn. In this association, he developed a capacity for solving mechanical problems that brought rapid advancement. He invented the epicycloidal milling machine for producing true curves in the teeth of gears and later designed a new process for generating and cutting spur gears. In 1880, he severed his connection with Pratt & Whitney and with Mr. Warner established the business which now is of large proportions. Mr. Swasey has held many honors, including the presidency of the American Society of Mechanical Engineers. He is a member of the Institution of Mechanical Engineers of Great Britain and of the British Astronomical Society; he is a fellow of the Royal Astronomical Society and in 1900 received the decoration of the Legion of Honor of France.

Robert W. Hunt, past president of the American Institute of Mining Engineers, paid a personal tribute to Mr. Swasey, as a life-long friend, and said that it is one of the few certainties of this world that the greatest earthly happiness comes to those who have made others happy.

This Foundation is the conception of one man who does not seek individual aggrandizement, but rather through his own munificence to create a base upon which others can unite with him in building a structure which will benefit all humanity.

Dr. Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, spoke upon the significance of the gift and its meaning for engineering science and civilization.

Significance to Public

"To the public the foundation of such a research agency in the field of applied science may well mean the inauguration of a series of studies having the greatest significance for public well-being and for public needs," he said. "The most striking illustration of such a result has been already given in the history of a small research laboratory of applied science, started in the technical school, at Charlottenburg, some 40 years ago. The effort arose out of the questions formulated and laid before the scientific staff of the technical school by the men of the steel industry; and out of the solutions of these questions the iron and steel industry of Germany grew.

Gradually the inquiry arose, why should there not be an institute of engineering research to which any citizen engaged in the industries may bring his problems? To whose laboratories may be brought not alone the questions relating to the manufacture of steel, but those relating to the chemical industry, textile industry, electrical manufacturing and industries of every sort, in a word, all the questions which today in the manufacturing establishments of a great nation are constantly being asked?

"Out of the little research laboratory at Charlottenburg have grown the great testing laboratories (Versuchtanstalt) covering many acres and offering themselves freely to the solution of every technical question that the industries in Germany can present. Any company engaged in the industries may bring its problems here. Any experts may come in and take part in the study, all the literature on the subject is made available, and under the combined efforts of the expert of the government laboratory and the experts of the industry a solution is generally found."

Every Man

Will Be Needed By June, Said Chas. E. Adams

At the meeting of the Metal Trades Superintendents' and Foremen's Club of Cleveland, Saturday evening, Jan. 30, Charles E. Adams, president of the Cleveland Hardware Co., delivered an address on "The Duties of a Superintendent or Foreman", and also spoke briefly on business conditions. Mr. Adams said that employers are recognizing more and more the duties which they owe to their employes. He said that never before was the idea of brotherhood so strong. He spoke of the hard times of past years, especially those of 1893, when, he said, employers turned out their employes by the thousands and closed the plants, while today, after business has passed through as bad a year as it ever had, manufacturers are doing all in their power to furnish employment for as many men as possible, and although it is true that large numbers of worthy men are idle, the number is far smaller than in previous periods of depression and is a great deal smaller than it would have been if manufacturers had not done all they could to keep plants in operation on at least part time.

Mr. Adams advocated insurance against unemployment and said he expected to put such insurance in force at his plant. As to business conditions, he spoke hopefully, and said that he believed that by next June there would be demand for every workingman in Cleveland. Already, he said, business in many concerns is improving.

W. D. Sayle, president of the Cleveland Punch & Shear Works Co., endorsed Mr. Adams' plan for insurance against unemployment. He said that under such a plan it would be to the interest of every one employed in a plant to see that men on the payroll were retained in some capacity instead of being displaced to make room for outsiders.

President B. D. Fuller, who presided, said that under the new plan of meetings of the club, prominent men would address the members, and Harrington Emerson, the well-known efficiency expert of New York, would be the speaker at the meeting March 6.

Burt Whiteley, head of the Whiteley Malleable Castings Co. and Whitely Steel Co., Muncie, Ind., has set aside a fund to furnish hospital service to persons who are ill and are financially unable to provide such attention themselves. The annual report of the board of directors of the fund states that during 1914, 123 patients were treated. They were in the hospital for periods ranging from one to 228 days.

Death of Major Henry M. Brewster

Major Henry Milton Brewster, formerly head of the Stebbins Mfg. Co., Springfield, Mass., died at his home in that city, recently, after a short illness, at the age of 73. Major Brewster long had been prominent in eastern foundry circles. His interest in the making of Millett core and foundry core ovens brought him into close touch with the trade, and his warm personality and cheerful disposition caused a great demand for his

MAJOR HENRY M. BREWSTER

presence at all gatherings of foundrymen.

He held a commission in the Union army during the civil war. His was the distinction of being adjutant in the city of Washington on the night when President Lincoln was assassinated, and a witness of the scenes attending that event. Soon after the war, he went to Haydenville, Mass., where he became manager of the Haydenville Brass Co. He became connected with the Stebbins Mfg. Co. in 1878, holding different positions till finally he was in control of the business at his retirement in 1907.

Operations have been resumed in one of the foundries of the Reading Hardware Co., Reading, Pa., which had been closed several months because of labor trouble.

Improvement

In Canadian Industries is Due to War Orders

Toronto, Feb. 2.—The only noticeable improvement in the condition of the iron and steel industry is the activity of the plants which have obtained large orders from abroad for war material and other supplies required by the allies. The Polson Iron & Ship Building Co. is the latest Toronto firm to engage in the manufacture of shrapnel shells, and is installing a special plant to fill its contracts. The Mueller Mfg. Co., of Sarnia, which has also received a large order principally for shells, has purchased new machinery for the purpose at a cost of $20,000. The Western Dry Dock & Ship Building Co., of Fort William, is installing machinery for the same purpose.

Will Hear Bill

The next meeting of the Philadelphia Foundrymen's Association will not be held at the Manufacturers' Club, as customary, but on Tuesday evening, Feb. 16, members of the association, through the courtesy of Billy Sunday, will occupy a section of seats in the Tabernacle which will be set apart for members of the association, their wives and friends. The usual sumptuous meal will not be served, but it is announced that "a hurried meal can be procured at the Billy Sunday restaurant, and, at the same time, the baby may be checked in the nursery."

The Austro-American Magnesite Co., for which the American Refractories Co. is sole agent, has just completed an addition to its plant at Radenthein, Austria, which will increase its output to 120,000 tons annually from the former output of 80,000 tons.

The Cambria Steel Co., Johnstown, Pa., contemplates the erection of slag walls along the Conemaugh river. The walls will be similar to those along the Monongahela river at McKeesport, Pa.

The plant of the Crescent Forge Co., at Oakmont, Pa., near Pittsburgh, will be remodeled for the Atlas Paper Box Co., recently organized.

Blowing engines at the Hannah blast furnace plant of the Republic Iron & Steel Co., Youngstown, O., are being repaired, to enable the company to increase capacity if warranted.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Howard S. Stebbins, who recently resigned his position with the iron ore firm of Oglebay, Norton & Co., Cleveland, has accepted a similar position with M. A. Hanna & Co., of that city. Mr. Stebbins has had more than 20 years' experience in the iron ore business, has a very large acquaintance and is a salesman of marked ability.

D. Fairfax Bush and William Dette, of the firm of Crocker Bros., New York, are now on a trip to the Pacific coast.

A. Fred Bertram has recently been appointed special representative for the Steel Improvement Co., Cleveland, for the Pittsburgh district and Youngstown.

Col. Henry P. Bope, vice president and general manager of sales of the Carnegie Steel Co., will be principal speaker at the annual banquet of the civic association at Sharon, Pa., Feb. 4.

F. W. Shilling was re-elected president of the Sharon Foundry Co., Sharon, Pa., at a recent meeting of the board of directors. Thomas Kennedy was elected secretary and treasurer.

John H. Hart, for five years manager of the Youngstown plant of the Concrete Steel Co., has been transferred to the Camden, N. J., plant of the company. Mr. Hart has been succeeded by J. F. Curley.

A. W. Wheatley, general manager of the Canadian Locomotive Co., of Kingston, Ont., has left for Russia, where he will endeavor to secure large contracts for locomotives or shrapnel from the Russian government.

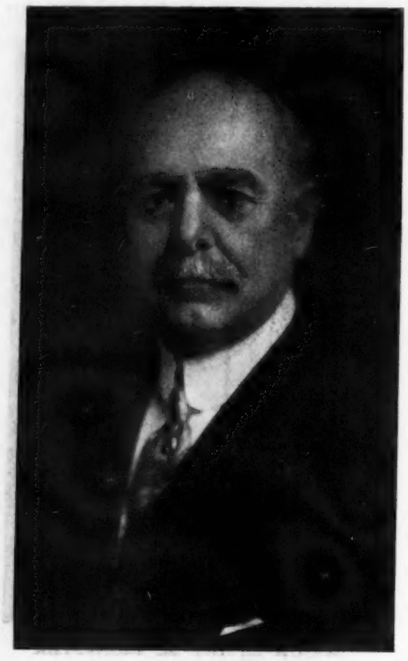
Albert C. Lehman has been elected president of the Blaw Steel Construction Co., Pittsburgh, manufacturer of steel forms for concrete construction. Mr. Lehman has been vice president and general manager of the company since its inception.

N. V. Hansell, of Hamilton & Hansell and the American Grondal Co., 50 Church street, New York, sailed recently for Europe. He expects to visit England, Russia and the Scandinavian countries before returning to New York.

Stanley G. Morris, formerly a salesman connected with the Philadelphia office of the Carnegie Steel Co., has accepted a similar position with the Republic Iron & Steel Co., in the same city, and will travel among the southeastern trade.

John H. Cavender has been made vice president of the Chicago Retort & Firebrick Co., Continental and Commercial National Bank building. He formerly was general manager of sales for the American Refractories Co., in Chicago.

N. D. Carpenter, district manager of sales for the Carnegie Steel Co., at Detroit, with headquarters in the Ford building, has resigned, effective



HOWARD S. STEBBINS

Feb. 1, and will be succeeded by Frank E. Spencer, formerly connected with the Pittsburgh sales office.

H. Sanborn Smith, vice president of the Gulf States Steel Co., has returned from Europe after a several months' trip in the interest of his company. No announcements have been made but reports are Mr. Smith secured considerable export business for the Gulf States company.

Samuel Adams, identified with the American Sheet & Tin Plate Co., Pittsburgh, at its Vandergrift works, has been appointed night superintendent of the hot mills at Farrell, Pa., to succeed J. J. Evans, who will retain his connection with the company in another capacity.

John W. Exler has been elected president and treasurer of the James Lappan Mfg. Co., Pittsburgh, for 1915, by the board of directors. James T. Lappan was elected secretary. Directors for the year are: John W. Exler, John E. Laughlin, Moorehead B. Holland, James T. Lappan and George W. Exler.

W. J. Wallis was re-elected president of the Youngstown Foundry & Machine Co., Youngstown, recently. Other officers elected were: F. A. Williams, vice president and sales manager; B. G. Parker, secretary and treasurer. These officers, with A. E. Adams, F. K. Hine, E. Hartzell and H. P. Parrock comprise the board of directors.

Hon. Nathaniel Curry, president of the Canadian Car & Foundry Co., who has been in Europe for some time looking after its interests and establishing an office in London, is on his way back to Canada. He has secured large orders for rolling stock in France and Russia, which will keep the plants of the company busy for some time.

Captain C. W. Brown, first vice president of the Pittsburgh Plate Glass Co., his son, Harold, and Gilbert T. Tafferty sailed from New York recently on a trip to Jamaica, Peru, Argentina, Brazil, Uruguay and other South American countries in the interests of several manufacturing concerns to promote trade with the South American republics.

B. Horton has been made New York manager of John J. Cain, North American building, Philadelphia, dealer in iron and steel scrap, and has headquarters at 143 Liberty street. Mr. Horton, for the past five years, has been connected with the United States Metal & Mfg. Co., New York City, and for 10 years previously was with John Leonard & Co., New York City. He succeeds N. S. R. Anderson, recently deceased.

Herbert N. Leonard has recently been appointed general sales manager of the Ferro Machine & Foundry Co., Cleveland, maker of automobile castings, marine and stationary gas engines, rowboat motors and other articles. Mr. Leonard had been connected with the sales organization of Armour & Co., Chicago, for the past 12 years, and previously aided in reorganizing the merchandising end of the business of the Booth Fisheries C

MEN OF MACHINERY TRADE

Who they are **Where they are** **What they are doing**

Francis Auberty, French agent for several American machine tool builders, is now in this country.

A. C. Cook, sales manager the Warner & Swasey Co., Cleveland, is in England on a business trip.

O. P. Meckel, general manager of the Baird Machinery Co., Pittsburgh, has resigned. His successor has not been appointed.

W. S. Chase, general manager of sales of the National Acme Mfg. Co., Cleveland, O., returned recently from a European business trip.

L. H. Mesker has joined the sales force of Kearney & Trecker Co., Milwaukee, manufacturers of milling machines, and will cover the Ohio territory.

J. P. Dolan has been appointed master mechanic of the Apalachicola Northern railway, with office at Port St. Joe, Fla., succeeding R. A. Billingham.

N. M. Barker has been appointed master mechanic of the Copper Range railroad, with office at Houghton, Mich., in place of J. A. Berg, assigned to other duties.

W. Malthaner has been appointed master mechanic of the Baltimore & Ohio railway, with headquarters at Newark, O., succeeding O. J. Kelley, assigned to other duties.

Frederick A. Brower has been made manager of the Oswego Machine Works' New York City business, with office in the Singer building, 149 Broadway, New York City.

A. W. Stephenson has been appointed representative of H. Boker & Co., Inc., in New Jersey and eastern Pennsylvania. A. S. Reeder will have charge of western Pennsylvania.

John C. Spence, superintendent of the Norton Grinding Co., Worcester, Mass., has returned home from a 10 days' trip through the middle west, with stops at Toledo and Detroit.

Frank D. Taylor, formerly of the Bridgeport Chain Co., has been appointed New England representative of the Peck, Stow & Wilcox Co., Cleveland, to succeed L. D. Brodhead, resigned.

A. D. Brice, assistant to the master car builder of the San Antonio & Aransas Pass railway, has been appointed master car builder, with headquarters at Yoakum, Tex., succeeding W. T. Cousley, resigned.

George K. Atkinson, formerly with John Steptoe Shaper Co., Cincinnati, and later manager of the Modern Machine Tool Co., Cincinnati, has associated himself with the Steinle Turret Machine Co., Madison, Wis.

P. M. Fowl, who has been associated with the Strong, Carlisle & Hammond Co. for the past six years at Detroit, Mich., has been promoted to the position of sales manager, succeeding the late Henry H. Boggs.

John K. Henry, one of the best known men in the machine tool trade in western Pennsylvania, recently

JOHN K. HENRY

became identified with the Laughlin-Barney Machinery Co., 1901 Union Bank building, Pittsburgh. He will represent the Laughlin company in the Pittsburgh district. Mr. Henry was identified with the Brown & Zortman Machinery Co., 2535 Liberty avenue, Pittsburgh, for 14 years.

Norman Bell has been appointed master mechanic of the Minnesota and Iowa divisions of the Illinois Central railway, with headquarters at Waterloo, Ia., succeeding Frank W. Taylor, resigned to go to another company.

Henry Souther, Hartford, Conn., consulting engineer, and for several years prominent in the work of the Society of Automobile Engineers, was presented with a silver piece, appropriately engraved, by his associates on the standards committee of the society, as a token of their admiration for the distinguished work he has accomplished for the engineering side of the automobile industry.

J. H. Dougherty, formerly with the International Steam Pump Co., has been engaged by the Northern Equipment Co. to take charge of centrifugal pump design and the improvement and development of the Erie line of centrifugals.

Charles E. Hildreth, of Worcester, Mass., general manager of the National Machine Tool Builders' Association, will represent it at the annual meeting of the Chamber of Commerce of the United States, at Washington, Feb. 3-5.

E. E. Griest, assistant master mechanic of the Pennsylvania Lines at Fort Wayne, Ind., has been appointed master mechanic at that place succeeding B. Fitzpatrick, deceased. F. T. Huston, assistant master mechanic at Pittsburgh, Pa., suceeds Mr. Griest.

Frank W. Taylor, division master mechanic of the Illinois Central railway at Waterloo, Ia., has been appointed superintendent of machinery of the International & Great Northern, with headquarters at Palestine, Tex., succeeding C. H. Seabrook, resigned.

Earl F. Scott has been appointed Georgia representative of the Terry Steam Turbine Co., Hartford, Conn. He will have offices at 702 Candler building, Atlanta, Ga. The Pittsburgh office of the Terry Steam Turbine Co., in charge of H. A. Rapelye, is now located at 1624 Oliver building.

Thomas F. Fournier, formerly efficiency engineer of the American Locomotive Co., and later district engineer of the Lamson Co., has been appointed chief engineer of the Becker Milling Machine Co., Hyde Park, Mass. Mr. Fournier will also direct the sales policy of the company.

R. McGregor, of Galt, Ont., president of the Stuart Machinery Co., Winnipeg, has been in the west making changes in the personnel of the company, which were imperative following the sudden death of Mr. McLeod, formerly managing director. J. L. Pollock, who was for a number of years sales manager of the Stuart Machinery Co., and who, two years ago, left for Medicine Hat, where he occupied the position of president and manager of the Alberta Rolling Mills, is to act as manager.

Money and Iron: Fact, Comment

Manufacturers' Views Are Discussed

In Continuation of Discussion of Mr. Marcosson's Article—Remarkable Decline in Stocks Attributed Almost Entirely to Passing of Dividend on Steel

Discussion of suggestions made by Mr. Marcosson in his article on New Finance for Iron and Steel continues to bring out very interesting points. For example, a prominent manufacturer, he does not wish to have his name disclosed, writes as follows:

"I have no doubt that the new banking law will be of benefit to the iron and steel and metal trades, possibly as much as it will be to other lines of production, manufacturing and mercantile projects. Different large lines of business will no doubt be benefited by the improved new form of banking, which is supposed to beneficially replace the old and outgrown banking and currency system.

"All of the panics this country has had for many years have been financial panics. It is a long time since we have had commercial panic. Possibly from the changed banking conditions we would be more in danger of a commercial panic in the future than of a money or strictly financial panic. The matter of extension or inflation, however, is said to be well guarded against by the new banking act. The new banking and currency act is yet so new and has yet had so little chance to show its benefits that we cannot say now how much greater use to the country it will be than the old but there is evident great confidence abroad that it will be a good change for the better. The writer, in talking last summer with a gentleman who had formerly large and extended transactions on the New York Stock Exchange and who has for the past five or six years retired from business with a competence, told the writer that our new banking and currency law is the best one that any country in the world has, and that he was of the opinion that it would be of tremendous benefit to our country. I have a strong impression that this new law is going to be of material assistance to our nation in fostering and securing foreign trade."

Letters from other manufacturers follow.

Medium Would Readjust Itself

George H. Boyd

President Valley Mould & Iron Co., Sharpsville, Pa.

Mr. Marcosson's interesting suggestion as to supplementing our present medium of exchange by a much more general use of acceptances in settlement of accounts, would give us a medium that would automatically adjust itself to fluctuations in the volume of trade perhaps better than any we now have.

The fact that up to the present time our banking system has not proved that source of dependence in time of stress especially, that we are entitled to expect, has undoubtedly curtailed the general use of credits in the United States as compared with other countries, and we could probably with much advantage utilize our credits as a basis for business to a much greater extent than we are accustomed to.

Perhaps we are expecting too much when we hope the new federal laws will give us the volume and elasticity in our circulation that experience has shown we need.

But if by reason of these laws our banks are able to extend the full amount of credit that each is entitled to, on application, is it desirable to stimulate the use of credit by encouraging the seller of a commodity, under the pressure of competition and trade extension, to expand the credit of his customers beyond the limits set by his bank, and use this expanded credit as a basis for a medium of exchange?

New and Old Methods

By J. G. Battelle,

President Columbus Iron & Steel Co., Columbus, O.

As the foreign trade of the United States increases, it will be necessary to adopt some other methods therefor, than our present system of open accounts, for the reason that foreign business is done on long time, and for this business the acceptance is the most satisfactory method of settling accounts.

From the standpoint of the American manufacturer doing a home business, the acceptance has more disadvantages than advantages. Terms on manufactured goods today, I think, are very largely net cash 30 days—this is certainly true of pig iron.

While these terms vary in many instances, still in our particular line they are adhered to, almost without exception.

If we should demand acceptances, it would be hard to get 30-day acceptances from the trade generally.

By the time goods are received and checked up, at least half of the 30 days would be gone, and there would be a tendency to increase the length of the credit that would, in the long run, be more of a disadvantage than an advantage.

The acceptance in itself does not put a single dollar of money into circulation, nor would an acceptance help anyone except in a very temporary way, unless in addition to taking acceptances in settlement of accounts the manufacturer agreed at the same time to extend an additional 30 or 60 days' credit.

The only possible way where there can be any expansion, except of the most temporary nature, is by the seller assuming a greater burden by doubling the line of credit he gives to his customers, thereby doubling his risk.

The acceptance was used in this country many years ago, at a time when longer credits were given than is the custom today, but usually accompanied by offer of cash discount, which was usually accepted by buyers.

Acceptances properly used would, without doubt, give this country a very sound commercial paper that could be used by the banks for rediscounting in the federal reserve banks.

The old banking laws would seem to us practically equivalent in efficiency to the new ones, for we certainly do not covet a large extension in credits currently, and when advantages of the new credits extended, incidental to the new laws, are availed of, then the condition will be much the same as before, except that things will be more on a credit basis than on a cash basis, which is certainly not desirable, if it can be avoided, and after the limit

of the new credit system is reached, there will be no more elasticity than under the old system.

There would have been more elasticity under the old system than under the new, if some wise plan could have been devised to utilize the surplus provided by law, when the demand for this use occurred.

Heartily Commended

By S. G. Gilfillan,

President Belfont Iron Works Co., Ironton, O.

I have read with much interest the article by Isaac F. Marcosson, entitled "New Finance for Iron and Steel", and I cannot but acknowledge that it is one of the most interesting articles that I have ever read, and in fact on the subject in question it is really the most interesting of anything that has come to my desk. The conditions are truthfully stated and graphically described, and to a very great extent I agree with everything contained in the article, and I am quite sure that the new banking system is going to be a very great help, especially so if it is fostered by the national banks.

It would really be presumptuous on my part to make any possible effort to criticize the article were I capable of doing so, but in this case there does not seem to be any excuse for criticism. On the contrary, the writer deserves our sincere thanks for the article in question, and I am convinced that it will be of very great service to the industrial world.

Causes of Slump on Stock Exchange

The slump on the New York stock exchange last week was a remarkable manifestation of the effect of a poor showing of earnings and passing of dividends on common stock by the Steel Corporation. F. F. Duncan, financial editor of the Cleveland Leader, commenting on this slump, said:

"Seldom in the history of the stock market has there been such a thorough demonstration of the extent to which the great body of shareholders have come to regard one issue as a barometer of conditions.

"That the passing of the dividend on Steel common should have influenced a drop of one to three points in the railroad list was really illuminating as to the extent to which the public has come to think in terms of the Steel dividend rate.

"In the financial district the action of the district caused scarcely a ripple of surprise. The financial columns of the newspapers have frequently referred to the probability of a total suspension of dividends on that stock. Wall street comment has mauled over the possibilities ever since the reduction from a 5 to a 2 per cent basis three months ago. The state of the steel trade and of steel earnings has been an open book. Yet it is now plain that to the average shareholder the suspension of the dividend came as a total surprise and as a severe shock."

Aside from the weakness due to the action of the Steel Corporation, developments for the week were for the most part favorable. The activity of the bond market as a feature and the sale of $40,000,000 in bonds by the Pennsylvania Railroad Co. was the principal item. To what extent the selling of these bonds will result in the placing of orders for new equipment has not been disclosed, but it is believed that a fair amount of buying will be done by the Pennsylvania lines at a not far distant date. The declaring of the regular quarterly 1½ per cent dividend by the Pennsylvania was received with much favor as it had been feared that it would be passed. The following list shows the extent to which important industrial stocks declined last week:

American Can	1¾
American Can, preferred	1¾
American Car & Foundry	1⅜
American Car & Fdy., preferred	1
American Locomotive	3½
American Steel Foundries	2½
Baldwin Locomotive Works	3½
Baldwin Locomotive Works, prfd.	¾
Colorado Fuel & Iron Co.	3½
General Electric Co.	1½
Lackawanna Steel	½
National Enameling & Stamping	¼
Pressed Steel Car	4½
Pressed Steel Car, prfd.	¼
Railway Steel Spring	1
Republic Iron & Steel	1¾
Republic Iron & Steel, prfd.	6
Sloss, Sheffield Steel & Iron	1⅜
U. S. Cast Iron Pipe & Fdy.	⅞
United States Steel	11⅞
United States Steel, prfd.	3⅛

Financial Notes

The offices of the M. Rumely Co. have been moved to La Porte, Ind., by Finley P. Mount, receiver.

The assets of the bankrupt Central Foundry Co., Muskegon, Mich., have been sold to S. P. Bacon, Cincinnati, principal creditor, for $4,500. Mr. Bacon intends to keep the plant running.

Ivy Lee has been made a director of the Colorado Fuel & Iron Co., vice Jerome D. Greene, resigned. Mr. Lee formerly was publicity manager of the Pennsylvania railroad and recently resigned to become connected with the Rockefeller Foundation.

The Brown Hoisting Machinery Co., Cleveland, has decided to pass the 1914 dividend on preferred stock. The company has been paying 7 per cent in quarterly installments, the entire 7 per cent payable to holders of record as of a certain date. It has paid without interruption since 1906.

The International Harvester Corporation and International Harvester Co. of New Jersey, has declared the regular quarterly disbursement of 1¾ per cent on preferred; Stewart-Warner Speedometer Corporation, regular quarterly dividend of 1½ per cent on common and 1¾ per cent on preferred; Inland Steel Co., Chicago, quarterly dividend of 1 per cent, same as for preceding quarter.

The Pressed Steel Car Co. has passed the dividend on common stock. In January, 1914, 3 per cent was declared, payable quarterly. The stock received 6 per cent in 1900, 4 per cent the next two years, 5 per cent in 1903, 3 per cent in 1904 and no dividends from 1904 until last year. Regular dividends on preferred have been paid since the company's organization.

Imports of Ferro

In 1913 the United States received from Russia and India about three-fourths of the manganese ore required for domestic use and imported from England and Germany about half the amount of ferro-manganese needed by the steel industry. D. F. Hewett, of the United States geological survey, who has examined the figures showing the imports of these materials for the first nine months of 1914, states that the receipts of manganese ore have been 42,550 tons, or 16 per cent less, and those of ferro-manganese 37,420 tons, or 37 per cent less than for the corresponding period in 1913. As the Russian ore is shipped from the ports of Poti and Batum, on the Black Sea, through the Bosporus, the entrance of Turkey into the war in October and the consequent closing of the straits to English ships will greatly curtail if not completely stop, the export of all Russian ore. It seems probable, therefore, that the receipts of ore during the last three months of 1914 were much less than for the corresponding period in 1913.

Business News from the Capital

Manufacturers Tell Secretary Redfield's Investigator That the Low Tariff is Responsible for Closing Many Plants

Washington, Feb. 2.—Slow progress is being made in the investigation being conducted by the bureau of foreign and domestic commerce, department of commerce, into industrial conditions in the Schuylkill valley, Pennsylvania. The investigation, begun as the result of charges made by the Manufacturers' Association of Montgomery county, Pennsylvania, that the depression is due to the tariff, has been confined so far chiefly to Norristown, and at the bureau of foreign and domestic commerce it was stated that the scope of the investigation rested with instructions given to the investigator, D. N. Barclay, by Secretary of Commerce Redfield. These instructions have not been made public. It has been construed by some as indicating a desire on the part of the department of commerce to minimize the situation and to narrow the investigations down to a comparatively small basis. Several weeks may be required before the complete report of Mr. Barclay has been made. So far only limited findings have been submitted. The situation with regard to the steel industry in the valley has not been taken up, and there is no assurance that it will be. The Montgomery county association, however, is earnestly endeavoring to lay all the many facts it has before the investigator and pressure may force the department to extend the scope of inquiry.

Mr. Barclay has been supplied with statements showing the depression existing among 14 industries in Norristown, four in Bridgeport, across the river, and in Conshohocken. Chas. F. Williams, president of the Montgomery county association, has taken Mr. Barclay through several mills. One of them was that of James Lees & Sons Co., Bridgeport, a $2,000,000 yarn-manufacturing institution. Mr. Williams said that if it were not for the war in Europe, one year would see the business establishments of the Schuylkill valley practically ruined. He pointed out that he had also taken Mr. Barclay through mills in Lees and declared he did not think anything could have been better proof of depression than the great buildings filled with silent machinery. There were seven mills, he said, and when running full they employ more than 1,000 men, but are now operating at about 60 per cent of full capacity. Invariably Mr. Barclay has been answered in the affirmative when he asked employers if they thought the tariff is responsible for the condition of the industries investigated.

Gompers' Charges

Washington, Feb. 2.—Filed with Chairman Burnett, of the house committee on immigration last Saturday were charges made by Samuel Gompers, president of the American Federation of Labor, that shipping, steel and mining corporations have financed the opposition to the immigration bill. The measure was vetoed last week by President Wilson chiefly because of its literacy clause, restricting the entrance of aliens to this country. Organized labor is vigorously supporting the clause, and is endeavoring to bring pressure to bear upon congress to pass the bill over the President's veto. Opinion is divided as to how successful congress may be in this direction. It seems apparent the contest will be close, although it is perhaps the prevailing opinion that it will not be able to pass the bill over the President's veto.

Claim is made by Mr. Gompers that his charges are "supported by authentic documents, many of which bear their own authenticity and others so circumstantially proven that there is no escape from their purport."

Weeks' Word of Caution

Washington, Feb. 2.—While approving of the federal reserve act generally, Senator Weeks, of Massachusetts, in an address last week at the mid-year meeting here of the American Electric Railway Association, made some constructive criticism of the measure.

One of the mistakes of the act, he observed, is that there is too much government and too little scientific banking control in its conduct. He had pointed out his opposition to the government's connection with business in any other way than for supervisory purposes. It was asserted by the senator that the government is not an economical business agency and is not established for business, but for those other purposes which are distinctly governmental in their character.

"We are in the midst," he said, "of a period of drifting into active government participation in those affairs with which the private individual is best competent to deal, either through his personal or corporate capacity, and, unless it is checked, federal reserve banking systems and all other progressive steps to aid the business man are going to have their effect destroyed or at least seriously menaced. There is no more important question before the American people than this one of government participation in the conduct of business and none compares with it in effect."

Pointing out that it is too early to criticize what has been done or is being done by those in charge of the system, Senator Weeks said its effect would very largely depend on the quality of its management. He advised his hearers that they cannot take a wiser course than to discourage every step which is now or may be taken to put the government into competition with private capital and private operation and to discourage every attempt at legislation which is going to put unreasonable restrictions and burden upon business.

Terminal Allowances

Washington, Feb. 2.—The interstate commerce commission will hear an oral argument on Feb. 12 in the matter of allowances to terminal railroads and the cancellation of rates in connection with so-called small lines. Involved in this proceeding are steel plant roads. The argument is expected to embrace an effort on the part of steel companies operating rail lines to have restored joint rates and through routes with trunk roads. Permanent re-establishment of joint rates apparently will require considerable time, as the work of appraising the physical valuation of the steel lines, now being conducted by their operating companies, involves a big task. Upon this valuation being completed the findings will be submitted to the commission, it is understood, and used as a basis for new relations to be resumed with the trunk carriers.

First Coke Drawn.—The H. Koppers Co., which has been building a by-product coke plant for the Lehigh Coke Co., at Bethlehem, Pa., drew the first coke Jan. 28 from the first unit of 106 ovens. Progress on the second unit of 106 ovens is such that coke will be drawn within a week from the opening of the first unit. The entire plant will consist of 424 ovens and construction of the remaining two units of 106 ovens each is progressing rapidly.

Problems of Capital and Labor

Unreasonable Demands of Labor Leaders in Oklahoma—Plate Contractors Form Association—Open Shop Established in Buffalo Building Industry

An example of the extreme measure to which labor unions will sometimes resort is being furnished in the state of Oklahoma, where many oil tanks are being erected. In the oil district, the boilermakers' union, beside pushing wages to the high level of 62½ cents an hour, closed its books some time ago, although its membership comprised not more than 50 per cent of the men needed on the work. After closing its books, the union issued permit cards to non-union men on condition of the payment of 10 per cent of the wages of these men into the union treasury. The contractors were made a party to this plan through the demand of the union that the 10 per cent should be deducted from the pay of the "permit men" and paid to the union by the contractors.

Plate contractors, not wishing to deal with such an unreasonable union, and knowing that the "permit men" are very anxious to break away from the union and go to work on their own account, receiving their full wages, decided to put their work upon an open-shop basis and this plan is now in process of accomplishment. To bring about the desired results in Oklahoma and elsewhere, the American Erectors' Association has been formed by the following companies: Standard Plate, Iron & Boiler Works, Niles, O.; Riter-Conley Mfg. Co., Pittsburgh; Warren City Tank & Boiler Co., Warren, O.; Petroleum Iron Works, Sharon, Pa.; Reeves Bros., Alliance, O.; Treadwell Construction Co., Midland, Pa.; Hammond Iron Works, Warren, Pa.

Walter Drew, commissioner for the National Erectors' Association, is counsel for the new association.

Opposed to Efficiency

Washington, Feb. 2.—Tacked on the army appropriation bill, which recently passed the house, was what is known as the Dietrick amendment providing that all "stop-watch methods" and "Taylor systems" shall be done away throughout all government workshops. It remains to be seen how the senate will receive this rider, artfully attached to a big appropriation measure under the apparent assurance that congress would not dare vote it down or the President veto it. Rider legislation, however, is being assailed more and more as time passes, and there is a chance that the senate may put into effect, when this especial rider comes before it, the rule requiring two-thirds vote before it can be received. However, the chance may be slim that either unanimous consent to leave the rider in the bill will be denied or an objection made to it, which would bring into play the two-thirds rule.

The adoption of the amendment by the house is a distinct victory for organized labor, which has waged an untiring fight against the Taylor system and other forms of scientific management, regardless of the adherence to the system by officers of the ordnance departments, led by Gen. William Crozier, chief of that end of the army organization. Secretary Daniels, of the navy department, it is believed, is in favor of abolishing the system in the navy yards.

Gen. Crozier's reports, as well as others carrying similar details, published in The Iron Trade Review, have utterly repudiated arguments of organized labor that the system is injurious in any way to workmen, but on the contrary say it requires no excessive labor at all, and results in better compensation for the laborers. Organized labor confidently feels that, if it can drive the system out of the government service, it will have made great progress toward abolishing it in private industry.

The Buffalo Situation

Buffalo today is practically an open-shop town in the building industry. The present situation has developed from a strike declared last August by the structural iron workers against the employment of a non-union man on the work of one of the local contractors. The National Erectors' Association took up the matter and with its assistance open-shop men were obtained for the job. A general building trades' strike to assist the iron workers was thereupon called and this in turn was followed by the action of the Builders' Exchange to the effect that the strike should be resisted and wherever union men refused to work, operation should proceed with such men as could be procured. The contractors made a general declaration of the open-shop and recently all the contractors of Buffalo became members of the National Erectors' Association.

This association has now opened an employment office at 21 Builders' Exchange, with H. R. Brady in charge. Mr. Brady, who also has charge of the office in Cleveland, has been on duty in Buffalo during the past few months and has handled the situation with great ability. The Builders' Exchange, with the co-operation and support of the Employers' Association and other business interests of Buffalo, is successfully maintaining its position.

Distributed to Employes

Total disbursements of $511,967.90 were made during 1914 to employes of the United States Steel Corporation and subsidiary companies from the United States Steel and Carnegie Pension Fund, according to the fourth annual report of the trustees. Of this amount, $29,260.94 went to employes of the American Bridge Co.; $48,879.43 to the American Sheet & Tin Plate Co.; $115,722.03 to the American Steel & Wire Co.; $122,914.71 to the Carnegie Steel Co.; $58,231.41 to the H. C. Frick Coke Co.; $37,586.82 to the Illinois Steel Co.; $47,346.93 to the National Tube Co.; $,903.10 to the National Tube Co.; $3,903.10 to the Tennessee Coal, Iron & Railroad Co.; $20,141.47 to the Oliver Iron Mining Co., and the balance to other subsidiary companies. The total disbursements in other years were $422,-.815.14 in 1913; $358,780.92 in 1912, and $281,457.37 in 1911, making a grand total of $1,575,021.33 distributed since the fund was established. The active pension cases on Jan. 1, 1914, were 2,092, and 612 were added during the year. Discontinuances in 1914 were 183, so the continued cases, Jan. 1, 1915, were 2,521. For the cases added during 1914, the average age was 63.33 years, the average service, 28.76 and the average monthly pension $20.40.

Would Amend Law

Desire for more liberal provisions under the New York State workmen's compensation act was expressed by labor leaders, especially those representing the iron workers and similar highly-paid trades, at a joint meeting of delegates of the New York State Council of the National Civic Federation and the State Federation of Labor at New York City last week. The labor representatives stated they wanted the right to sue under the act in case of injury or death as it was stated the law works a hardship upon these classes.

February Business Looks Good

Last Week in January Witnesses Spurt in Machinery Business—
—More War Orders—Home Demand Better

THE PASSING of the last week of January was signalized by a marked increase in activity in the machinery market in the east, and the ushering in of February is attended with promising indications. A great deal of actual business has been transacted during the past 10 days and there is a large amount of new business pending. Most of this activity is on account of further war orders, but considerable also has originated from domestic manufacturers who have not booked such orders. The chief developments are the booking of a shrapnel contract by the Montreal plant of the American Locomotive Co., and of a contract for shells by a Pennsylvania car wheel manufacturer. The buying of equipment by these concerns so far involves only a few hydraulic projectile presses, bought by the Locomotive company, so that both companies have considerable purchasing to do. A concern in greater New York, which also booked a war order, was a large buyer last Friday; this company bought some 100 turret lathes and is expected to close at once on a quantity of other equipment. The Washington Steel & Ordnance Co., Washington, D. C., which has a shrapnel contract, closed for a large number of lathes. One of the heaviest buyers of the week was F. Auberty, Paris, France, who is staying at the Hotel Brevoort, New York. Among his purchases were 110 milling machines, 50 grinders and a large number of sensitive drilling machines for export to France, and 75 milling machines for export to Russia. That further war orders may be placed is indicated by inquiries for large quantities of shrapnel-making machinery put out by a concern with headquarters in New York. The Bethlehem Steel Co. on Friday offered to sublet part of its shrapnel contract to other concerns, such concerns to make the shrapnel from Bethlehem forgings. The Bethlehem Steel Co., which originally inquired for 16 cranes for its bridge shop extension, has awarded four of these to the Pawling & Harnischfeger Co., Milwaukee; of the remaining 12, two have been dropped, but three new cranes have been added, making the pending cranes 13 in number. In addition, there is considerable other crane business under quiet negotiation. The Splitdorf Electrical Co., Newark, N. J., has placed orders for a considerable quantity of machinery, including mainly milling machines, drilling machines and turret lathes. The American Piston Ring Co., Newark, N. J., and George B. Douglas, 29 Broadway, New York, each have taken bids on considerable quantities of second-hand machinery. Hilles & Jones Co., Wilmington, Del., has taken bids on an engine lathe. The East Jersey Pipe Co., 50 Church street, New York, shortly will buy equipment for a new plant at Paterson, N. J. The Magor Car Co, Athenia, N. J.; the Watson-Stillman Co., Aldene, N. J., and the Charles L. Seabury Co., Morris Heights, New York, all are expected to be in the market very shortly. The Newport News Ship Building & Dry Dock Co., Newport News, Va., is taking bids on several very large engine lathes. The Watertown arsenal has taken a 30-inch projectile lathe from Niles-Bement-Pond Co. It now is expected inquiries from China for blast furnace and rolling mill equipment for the Hangyeh Pig Iron & Steel Co. will be received in this country about the latter part of March. A good many inquiries are current for machine tools for export, but it is difficult to ascertain how many of these are of the character that lead to the placing of actual business. For instance, one lathe manufacturer last week received at least a dozen inquiries each calling for prices on 40 turret lathes; it developed all of these inquiries involved the same identical business. Aside from such inquiries, some further good-sized orders for export were placed last week. A shell contract has been taken by the Forged Steel Wheel Co., Butler, Pa.

The machine tool trade in Cincinnati has just completed one of the busiest months in its history, which is a direct reversal of the beginning of 1914, when conditions were very quiet. Business as a whole has come chiefly from European countries engaged in the war and the domestic orders booked by local concerns shows no improvement over that of January, 1914. Demand during the past month has been centered largely on lathes and metal-boring machinery, and plants such as the Lodge & Shipley Machine Tool Co., the American Tool Works Co., the R. K. LeBlond Machine Tool Co., the Cincinnati Planer Co., the Cincinnati Bickford Tool Co., the Acme Machine Tool Co., the Greaves-Klusman Machine Tool Co., and the Sebastian Lathe Co., are running full force, and have enough orders on hand to keep them busy throughout the first six months of the year. The J. A. Fay & Egan Co., which manufactures woodworking machinery, has been experiencing a period of inactivity, but recently received large orders and will now operate on full time. The Cincinnati Iron & Steel Co. has made four large shipments of 14, 16 and 18-inch engine lathes to Italy and has also received other large European orders. Domestic business for this firm has been better than usual. One machine tool plant has been placed in the hands of the receiver during the past month, that of the Hamilton Machine Tool Co. One reason given was the inability to borrow money to meet payrolls. Manufacturers of shapers and planers in this district have not experienced very much of an increase in business, as no demand for these machines has come from Europe.

Improvement in the machinery market in western Pennsylvania in the initial month of 1915 was not pronounced, but it was sufficient to lead Pittsburgh dealers to believe conditions gradually will approach normal. Numerous single inquiries have come out since the close of last year, but no attractive lists are before the trade. There is some indication that rolling and finishing mills, now operating at moderately increased capacities, soon will ask bids on much needed equipment; but such inquiries will depend upon the future trend of the market. Possibilities for selling machinery are found in the announcements that the Greenville Car Co., Greenville, Pa., is increasing capacity to a considerable extent; that the Superior Steel Co., Carnegie, Pa., plans to rebuild sections of its plant recently destroyed by fire; that the Kennedy-Stroh Corporation, the organization of which was mentioned in the Jan.

Ayer & Lord Interior Wood Block Flooring in plant of Danville Malleable Iron Co., Danville, Ill., undergoes unusually severe treatment.

Pots are built on floor, filled with castings, put into the furnaces, taken out and dumped on floor. Blocks do not even char. Heavy charging buggies continually traversing floor without the slightest ill effect.

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The dividends that this investment pays are saved from the yearly expense of flooring repairs; are saved from the yearly loss of machinery bearings and parts damaged by grit; are saved from the continual loss of time, and liability to accident from working on uneven surfaces; are saved from the lost efficiency of the workmen that always exists wherever damp and disintegrating floors are found.

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Always Easy on the Feet
WOOD BLOCKS

28 issue of THE IRON TRADE REVIEW, plans to make numerous extensions to its plant at Oakmont, Pa.; that the Weirton Steel Co., which manufactures strip steel at Weirton, W. Va., will double its output at an early date, and that the Standard Chain Co., Pittsburgh, contemplates the erection of an addition to its electric welding department at York, Pa.

Dealers in machine tools have received somewhat more inquiry during the past week, much of which can be attributed to the presence of garage owners at the automobile show. This has resulted in some sales of second-hand equipment for this use. Some additional business has come to light also as the result of auto truck makers being pushed for delivery of their machines for export, added equipment being necessary to turn out the trucks. Some activity is evident among builders of can-making machinery and the demand for small lathes continues. Some selling of the latter for export has taken place in this territory. As a general proposition actual selling is not much increased and many concerns represented here find their business is not quickened in the least. The market appears to be spotted and while some sellers are able to point to an increase in their inquiry and sales over the latter part of last year for the most part dealers find conditions little changed.

EASTERN STATES

MANCHESTER, N. H.—W. H. McElwain Shoe Co. will erect a $100,000 addition to its plant this spring.

BOSTON.—Baxter Mfg. Co., motor vehicles, has been incorporated; $80,000 capital stock; by M. A. Daniher, John R. Lazenby, Edward T. Roche.

NORTH ADAMS, MASS.—Babcock machine shop was slightly damaged by fire.

SALEM, MASS.—Architect E. R. Simpson, 176 Federal street, Boston, has let the contract for a one-story, 50 x 95-foot foundry, for the Salem Foundry Co., Salem.

SPRINGFIELD, MASS. — American Saw Mfg. Co. has been incorporated; $15,000 capital stock; by John T. Swanson, Carl G. Davis, Carl L. Ericson.

WORCESTER, MASS.—Boston Wrench Co. has leased additional space on the eighth floor of the Burgess-Lang mercantile building, to be equipped with new machinery for manufacturing specialties.

PROVIDENCE, R. I.—Stephens Nut & Bolt Co., manufacturer, has been incorporated; $50,000 capital stock; by Albert C. Jacob and Jennie I. Stephens, Pawtucket, R. I.

BROOKLYN, N. Y.—Turner Construction Co., 11 Broadway, New York, has contract for adding two stories to plant of Doehler Die Casting Co., Brooklyn.

BUFFALO.—United States Rubber Reclaiming Co. will rebuild sections of its plant recently damaged by fire; the loss was $75,000.

BUFFALO.—Condron Co., 53 West Jackson boulevard, Chicago, is drawing plans for a $500,000 assembling plant, to be erected at Main street and Erie railroad tracks, Buffalo, for Ford Motor Co., Detroit.

KINGSTON, N. Y.—Fuso Mfg. Co., concrete building supplies, etc., has been incorporated; $30,000 capital stock; by John G. Van Etten, Jacob J. Herb, Rollin C. Wilson, 5 East Forty-second street, New York City.

LONG ISLAND CITY, N. Y.—Fred Ayer, Milk street, Boston, has let contracts for erection of five-story factory building, 100 x 181 feet, on Harrison avenue, Long Island City.

LONG ISLAND CITY, N. Y.—Clark, McMullen & Riley, 101 Park avenue, New York, are the engineers for a power plant to be erected on Mott avenue, Long Island City, for C. A. Willey & Co.

MIDDLETOWN, N. Y.—Commissioner of public safety will receive bids until 4 p. m., Feb. 20 for laying 6,000 linear feet of 20-inch cast iron water main.

NEW YORK.—Geo. B. Douglas, 29 Broadway, has out an inquiry for a number of second-hand machines.

NEW YORK.—W. J. Wayte, Inc., mechanical, chemical, engineering, machinery, has been incorporated; $10,000 capital stock; by F. L. Kopff, C. R. Small, W. J. Wayte, 1 Liberty street.

NEW YORK.—Everett Realty & Construction Co., Flatiron building, has sold a 150-foot plot on Jackson avenue, extending west 175 feet on West Tenth street, Long Island City, to a company which will erect a 12-story factory building.

NEW YORK.—Chas L. Seabury Co., manufacturer of gasoline engines, Morris Heights, contemplates making several important improvements.

NEW YORK.—American Locomotive Co.'s Montreal plant has booked a shrapnel contract and already has purchased hydraulic projectile presses; it is in the market for other equipment.

NEW YORK.—Cevasco, Cavagnaro & Ambrette, machinists, macaroni machinery, ribbon cutters, have been incorporated; $75,000 capital stock; by J. Cevasco, C. Ambrette, Nicholas J. Cavagnaro, 68 Green street.

POUGHKEEPSIE, N. Y. — Poughkeepsie Concrete Stone Co. has been incorporated; $10,000 capital stock; by H. B. Vosburgh, C. M. Loyd, B. D. Holden.

ROCHESTER, N. Y.—Architect Jas. R. Tyler, Insurance building, is drawing plans for two-story, 70 x 85-foot building for Harrison Radiator Works in which Oliver Diahl, Lockport, N. Y., is interested.

QUEENS, N. Y.—Queens Plaza Contracting Co., general contracting, has been incorporated; $20,000 capital stock; by William C. Toal, Peter K. Kelly, John W. Boyle, 53 McKinley street, Corona, N. Y.

BRADDOCK, PA.—Charles W. Milligan, architect, Wilkinsburg, Pa., is asking bids for a four-story and basement addition to the Braddock General Hospital, which will be of a steel and brick construction.

BRADFORD, PA.—Fire damaged the plant of the Blaisdell Machinery Co. at South Bradford.

CARNEGIE, PA.—Superior Steel Co., whose plant recently was damaged by fire, entailing a loss of about $100,000, has engaged C. R. Snyder, engineer, to rebuild the plant.

EASTON, PA.—West Branch Steel Co. has been incorporated; $100,000 capital stock; by James L. Evans, W. G. Blum, Joseph Maurer.

ERIE, PA.—Richard Irwin, architect, Pittsburgh, has plans for an eight-story brick, steel and reinforced concrete building to be erected at this center; bids are being received by H. J. Schlosser, owner.

GREENVILLE, PA.—Reported steel car department of the Bessemer & Lake Erie railroad shops at this center, will be doubled in capacity.

GREENVILLE, PA.—Greenville Steel Car Co. is erecting a 90 x 500-foot extension to its plant; some new equipment may be installed.

HARRISBURG, PA.—Fire did about $10,000 damage in the electric supply plant of the Harrisburg Pipe & Pipe Bending Works; electric motors, dynamos and machinery were damaged.

NEW CASTLE, PA.—Burrows Foundry Co., Elwood City, recently damaged by fire, will resume operations at an early date.

NEW CASTLE., PA—New Castle Rubber Co., recently incorporated, is erecting a plant, 80 x 340 feet, for the manufacture of automobile tires and tubes; motor driven machinery will be installed; E. M. Ohl, W. M. Schoen, A. B. Berger, E. H. Bainard, Charles H. Bolton, W. B. Rhodes and James Rhodes, all of Pittsburgh, are interested; Messrs Ohl and Schoen, both of whom are officers of the company, have offices in the Farmers Bank building, Pittsburgh.

NEW CASTLE, PA.—Contract for a steel and concrete bridge over the Shenango river at Mahoning street, has been awarded the G. W. Ensign Co., Harrisburg, Pa.

OIL CITY, PA.—Oil City Foundry Co., which recently leased the plant of the Riverside Engine Co., will equip it for machine finishing work and for assembling air compressor parts and air heads.

PEN ARGYLE, PA.—F. D. Hyde Co., 90 West street, New York, has general contract for erecting locomotive shop and storehouse here for Lehigh & New England railroad.

PHILADELPHIA.—Haskell-Dawes Machine Co. has increased its capital stock from $30,000 to $50,000.

PHILADELPHIA. — Mitchell Bros. have secured contraet for making alterations and additions to plant of Samuel J. Creswell Iron Works.

PHILADELPHIA.—Phillip Haibach Contracting Co., has general contract for erecting boiler and machine shop, two-story and basement, 36 x 76-foot for Norris Market Ice Manufacturing & Cold Storage Co.

PITTSBURGH.—Brandenville Coal & Coke Co. has increased its debt $75,000.

PITTSBURGH.—G. M. Newhall Engineering Co. has increased its debt to $43,000.

PITTSBURGH. — Pittsburgh Electric Specialty Co. has increased its capital stock from $150,000 to $250,000.

PITTSBURGH.—Prest-O-Welding & Supply Co. has been incorporated; $5,000 capital stock; by G. W. Stone.

PITTSBURGH.—Janssen & Abbott, architects, have completed plans for an $80,000, eight-story laundry building, 40 x 110 feet, for the Fort Pitt hotel.

PITTSBURGH. — Logan-Gregg Hardware Co. has purchased property for the erection of a $200,000, eight-story, 91 x 116-foot, fireproof warehouse and office building.

PITTSBURGH.—Contracts will be awarded about April 1 by the Baltimore & Ohio railroad for the elimination of the grade at Liberty avenue.

PITTSBURGH.—S. H. M. Mfg. Co., manufacturer of tools and machinery, has been incorporated with a capital of $5,000, by F. A. Hewitt, William Shaw, Pittsburgh; H. W. McLaughlin, Aspinwall, Pa.

PITTSBURGH.—F. C. Sauer, 804 Penn avenue, has the plans for a five-story fireproof temple for the Elks to be erected on Sandusky street, at a cost of approximately $150,000.

PITTSBURGH.—Kennedy-Stroh Corporation, recently organized, which has taken over the plant of the Best Mfg. Co., will increase capacity at an early date; officers of the com-

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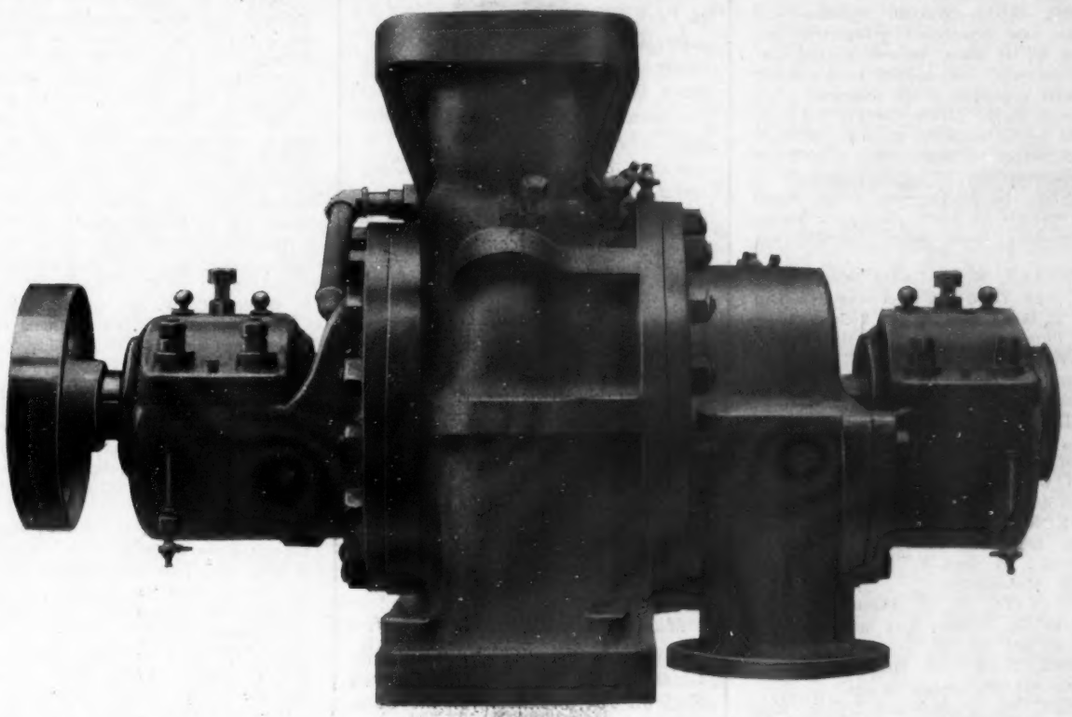
Centrifugal Pumps

This Pump, driven by a Low Pressure Steam Turbine, saves Coal at a rate that will pay for the Unit in a few months



Saves Steam **Saves Space** **Saves Oil** **Saves Attendance** **Saves Repairs**

This 6" pump delivers 750 gallons per minute against 550 lbs. per sq. in. The casing is of steel, the impellers of bronze.

This pump gives better service than the reciprocating plunger pumps that it displaces.

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Write for full particulars.

SOUTHWARK FOUNDRY & MACHINE CO., Philadelphia

Founded in 1836 ***The First Builders of Large Centrifugal Pumps in America***

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pany are in the Farmers bank building and at Oakmont, Pa.; W. H. Schoen, president.

PITTSBURGH.—Standard Chain Co., First National Bank building, contemplates the erection of an addition to the electric welding department of its plant at York, Pa.; the building will be 100 x 400 feet, of steel construction, with brick walls, cement floor and fireproof roof.

PITTSBURGH.—Atlas Paper Box Co., recently organized, has taken over the plant formerly occupied by the Crescent Forge Co., at Oakmont, Pa.; the Atlas company has awarded a contract for concrete floors and metal sash, and will install necessary equipment for a one unit system.

READING, PA.—West Reading Motor & Hardware Co. has increased its capital stock from $25,000 to $50,000.

SHIPPENSBURG, PA.—Domestic Engine & Pump Co. has increased its capital stock from $100,000 to $150,000.

ALDENE, N. J.—Watson, Stillman Co. which last year abandoned prospective improvements to its plant, because of the outbreak of the war, has decided to go ahead with at least a portion of the program.

ATHENIA, N. J.—Magor Car Co. has complete plans for a one story addition; Barclay, Parsons & Klapp, 60 Wall street, New York, are the engineers.

BAYONNE, N. J.—Precious Wood Handling Co., expects to begin shortly rebuilding its woodworking plant, which recently was burned.

EDGEWATER, N. J.—United States Aluminum Co., New York, will erect several factory buildings at this center; E. S. Fickes, Oliver building, Pittsburgh, is preparing the plans.

ELIZABETH, N. J.—Waclark Wire Co. will replace its wooden buildings with structures of steel and brick, to cost about $31,500.

FLEMINGTON, N. J.—Flemington Horse Shoe Co., has purchased a large new plant along the New Jersey Central railroad by means of which it greatly will increase its production of patented horseshoes.

HOBOKEN, N. J. — James McLaughlin Auto Co. has been incorporated; $125,000 capital stock; by Earl F. Bosworth, James and A. M. McLaughlin.

JERSEY CITY, N. J.—Plant of Gibson Iron Works Co., founder and machinist, was damaged by fire Jan. 26.

NEWARK, N. J.—Art Metal Works suffered about $15,000 damage by fire.

NEWARK, N. J.—American Piston Ring Co., 378 Jelliff avenue, has let contract for a one-story, 75 x 156-foot plant, at South Tenth street and Avon avenue.

NEWARK, N. J.—Splitdorf Electrical Co., which recently took bids on a considerable quantity of machinery, including milling machines, drills, turret lathes, etc., to be used in the manufacture of an automobile starter, has closed for a portion of this equipment.

NEW BRUNSWICK, N. J. — Endurance Tire & Rubber Co., main office at 1789 Broadway, New York City, has let the contract to the David Henry Construction Co., Paterson, N. J., for the erection of a $50,000 plant along the Raritan River railroad; Clement H. Eckrode and A. C. Perkins, New Brunswick, are officials of the rubber company.

PATERSON, N. J.—East Jersey Pipe Co., with headquarters at 50 Church street, New York, has let contract to McClintic-Marshall Co., Pittsburgh, for erecting new plant in Paterson, to replace that burned last year; the company manufactures lock bar pipe.

TRENTON, N. J.—Talbot Boiler Co., a western manufacturing concern, has been incorporated in New Jersey; $100,000 capital stock; by Paul A. Talbot, Paul C. Mulligan, Frank W. Chambers, all of Seattle, Wash.; Francis C. Lowthorp.

TRENTON, N. J. — Representatives from New Jersey and Pennsylvania are urging congress to sanction a $15,000,000 steel draw bridge across the Delaware river from Camden, N. J., to Philadelphia; it is proposed Pennsylvania appropriate $5,000,000, New Jersey, $5,000,000, and the government a similar sum.

It's a Long Way

To a certain city in Ireland,
But—
It's a short way
To get business in the
U. S. A.,
When you read this column
EVERY week.

Standard Chain Co., First National Bank building, Pittsburgh, plans the erection of a 100x400-foot, brick and steel addition to the electric welding department of its plant at York, P[illegible]

Banting Mfg. Co., Toledo, O., recently incorporated at $400,000, plans the erection of a large plant for manufacturing grain separators and other farm machinery. The company owns five acres on Door street, where one building already has been erected. C. P. Banting is identified with the company.

Peckham Coal & Ice Co., Troy, O., has purchased property on Daller street, Dayton, O., for the erection of a 150x610-foot, fireproof building, to be [illegible] modern ice-making machinery.

Mingo Block Coal Corporation, Mingo, W. Va., recently organized, plans the construction of two plants each with capacities of 1,500 to 2,000 tons a day. E. T. Hitchman, Wheeling, W. Va., is president; George S. Sarver, Greensburg, Pa., is treasurer.

Midland Warehouse & Transfer Co., 1929 West Forty-third street, Chicago, has obtained plans from S. Scott Joy, architect for the Central Manufacturing District, for a $600,000, four-story 260 x 405-foot, reinforced concrete warehouse. Three tracks of the Chicago Junction railway will enter the building at the second floor level.

American Locomotive Co.'s Montreal plant has booked a shrapnel contract and has already purchased hydraulic projectile presses; it is in the market for other equipment. Forged Steel Wheel Co., Butler, Pa., also has booked a large shell contract.

Hilles & Jones Co., Wilmington, Del., is in the market for an engine lathe.

George B. Douglas, 29 Broadway, New York City, has out an inquiry for a number of second-hand lathes.

VENTNOR, N. J.—President of the council is receiving bids until Feb. 15 for centrifugal pumps for intercepting sewer.

WEEHAWKEN, N. J.—Plant of Weehawken Dry Dock Co. damaged by fire.

WILMINGTON, DEL.—Hilles & Jones Co. is in the market for an engine lathe.

WILMINGTON, DEL.—National Machine Co., Fifth and Orange streets, has decided to postpone the contemplated improvements to its plant, which included the erection of a proposed addition; architect, Roscoe C. Tindal, Equitable building, Wilmington.

BALTIMORE.—Baltimore Tube Co. has let contracts for a one-story addition.

WASHINGTON, D. C.—Bureau of supplies and accounts, navy department, is receiving bids till Feb. 16 for pneumatic motor hoists for Mare Island.

CENTRAL STATES

AKRON, O.—Akron Motor Lock Co., manufacturer, has been incorporated; $1,200 capital stock; by M. N. Smith, J. H. Dugan, J. F. Miller, J. S. and G. H. Hill.

ATHENS, O.—Dias Paving Block Co. is planning a large plant on the K. & M. road, to be constructed on the unit system; plans include factory, kilns, dryer, etc., to be erected of steel and brick; the kiln will be of continuous pipe and will be 750 feet long; arrangements will be made with the Hocking Power Co. to furnish power.

BELLEVUE, O.—Klein Iron Works Co., manufacturer, has been incorporated; $15,000 capital stock; by C. P. Klein, W. L. and M. E. Willing, C. W. and G. A. Burk.

BUCYRUS, O.—State utilities commission has granted authority to the Bucyrus Light & Power Co. to issue $58,000 in 5 per cent bonds to be used for improving the plant; General Manager Moser says the company will purchase a steam plant to take the place of the old equipment and gas engine now in use; the power equipment will cost $41,000, and $17,000 will be spent in the betterment of other equipment.

CANAL DOVER, O.—Reeves Mfg. Co. has purchased the business of the Ohio Stove Pipe & Mfg. Co., New Philadelphia, O., according to a report from that center; present capacity of the New Philadelphia plant probably will be increased.

CINCINNATI. — Second hand machinery and equipment of the Maley Thompson & Moffett Co. will be sold at auction shortly.

CINCINNATI. — Plans for the proposed steel and reinforced concrete women's building at the University of Cincinnati, have been altered to make that structure larger and to include a swimming pool, larger gymnasium, etc.; original cost was estimated at $120,000; new plans call for an expenditure of about $150,000.

CLEVELAND.—Cleveland Saw Guard Co. has been incorporated; $5,000 capital stock; by W. F. Holliday, A. E. Clevenger, M. K. Davey, M. L. Heuer, Charles M. Buss.

CLEVELAND.—Bolton-Pratt Co. will start work at once on a brick, steel and concrete addition to the Chandler Motor Car Co., East 131st street; Earnest McGeorge, architect.

CLEVELAND. — Sylla Goodman Bottling Co., manufacturer, has been incorporated; $25,000 capital stock; by Louis Goodman, J. S. Stark, W. W. Rosenzweig, K. L. Fuller, U. R. Corlett.

CLEVELAND.—Lincoln Electric Co. will erect a $10,000 office building, in extension to its present plant at Kelly avenue and East Thirty-eighth street; plans by the Forest City Engineering Co.

CLEVELAND.—Cleveland, Akron & Canton Terminal Railway Co. has made a contract with the Osborn Engineering Co., Cleveland, for surveys and plans for the proposed $10,000,000, railroad subway under East Fifty-fifth street, between the lake front and the Cuya-

hoga valley; O. C. Barber, Barberton, O., is president railway company.

CLEVELAND.—H. Wagner Rubber Co., Akron, O., has acquired the plant formerly occupied by Samuel Austin & Sons Co., at Broadway and Gallup streets; plant will employ about 100 persons and machinery will be brought from Akron at once.

COLUMBUS, O.—Hub Motor Truck Co. has been incorporated; $300,000 capital stock; by T. C. Hanly, John L. Herpich, John B. Baas, R. Wilke, John J. Chester.

COLUMBUS, O.—Latty Die & Tool Co., manufacturer, has been incorporated; $10,000 capital stock; by G. F. Latty, Isador Yassenoff, J. A. Weidler, J. E. Campbell.

DAYTON, O.—Yeazell & Ernest Co. has sold to the Peckham Coal & Ice Co., Troy, O., a site on Daller street, a 150 x 610-foot, fireproof building will be erected, equipped with modern ice-making machinery.

DELAWARE, O. — Delaware Automatic Block Machine Co. will be organized for $10,000 for the manufacture of a patented automatic cement block machine, one of the inventions of William Hazelton, Delaware; the erection of a factory is planned, although a site has not been chosen.

DELPHOS, O.—Mueller Implement & Automobile Co., which recently increased its capital stock from $75,000 to $125,000, will increase the size of its plant in the spring.

DENNISON, O.—Business men have petitioned the county commissioners for a new one-span bridge on Center street, over Still water creek.

EAST PALESTINE, O.—Board of trustees of public affairs has been authorized to purchase new equipment for the electric lighting plant, which will double its capacity; an engine and boiler will be traded in on the new equipment; a bond issue for this purpose has been authorized.

EAST YOUNGSTOWN, O.—City council contemplates the installation of a city water works; Chester & Fleming, engineers, Pittsburgh, are preparing plans.

ELYRIA, O.—American Iron Roofing Co. changes location from Elyria to Middletown, O.

FOSTORIA, O. — Bids will be received shortly for a $150,000, fireproof high school building.

LIMA, O.—Lewis Bros., which recently moved to Lima from Rockford, O., will start the erection of a $50,000 building for the manufacture of hard wood interior finish when weather permits.

LOWELLSVILLE, O. — Village council again is considering the construction of a municipal water works.

NEWARK, O.—Butler Fan & Motor Co. has been incorporated; $10,000 capital stock; by James K. Dewey, Clark B. Hatch, L. M. Krieg, Ralph I. Davis, R. F. Collins.

NEW PHILADELPHIA, O.—Rath Aluminum & Brass has been incorporated; $40,000 capital stock; by C. J. Rath, N. W. Senhauser, R. S. Barton, C. H. Marlow, Walter Graff, W. A. Wagner.

PANDORA, O. — Pandora Cement Block Co., manufacturer, has been incorporated; $6,000 capital stock; by Levi, Cleo and Ben Neuenschwander, Philip Moser, David Lehman.

TOLEDO, O.—Service Director Boardman has been instructed to build a bridge over Swan creek at Champion street.

TOLEDO, O.—Banting Mfg. Co., recently incorporated at $400,000, plans the erection of a large plant for manufacturing grain separators and other farm machinery; the company owns five acres on Door street, where one building already has been erected. C. P. Banting is identified with the company.

WARREN, O. — Board of education has awarded the contract for the erection of four school buildings to J. C. Davidson, Columbus, O., at his bid of $125,000; work will start when weather permits.

WARREN, O.—General Electric Co. will increase the factory space of the Mahoning Lamp Works, giving it a daily capacity of 25,000 lamps; it is understood the Shelby plant of the General Electric will be moved to Warren.

WOOSTER, O.—Wooster Shale Brick Co. has increased its capital stock from $150,000 to $300,000.

ZANESVILLE, O.—County commissioners are asking bids for a 51-foot steel bridge in Cass township.

ZANESVILLE, O.—County commissioners have been advised by the war department that a draw span bridge must be built at Philo.

CHARLESTON, W. V.—Becker Steel Co. will build a $15,000 warehouse; Architect Rus Warne has the plans.

FAIRMONT, W. VA.—Directors of the Consolidation Coal Co. have authorized a $7,000,000 issue of 7 per cent debenture bonds to provide for extensions and improvement to the property.

MINGO, W. VA.—Mingo Block Coal Corporation, recently organized, contemplates the construction of two plants, each with capacities of 1,500 to 2,000 tons a day; E. T. Hitchman, Wheeling, W. Va., president; George S. Sarver, Greensburg, Pa., treasurer.

MORGANTOWN, W. VA.—Wilfong Coal & Coke Co. has been incorporated in this state with a capital of $10,000, by John W. Wilfong, Edward Wilfong and L. C. Wilfong, Fairmount, W. Va.; and W. L. Boughner and Thomas Ray Dile, Morgantown.

MORGANTOWN, W. VA.—Contract for the construction of a reinforced rib arch bridge has been awarded to Cole Bros., Baltimore, Md.; the bridge will have a 150-foot span, a 30-foot roadway and 8-foot sidewalk; about 70 tons of deformed steel bars and 100 tons of structural shapes will be required.

PRINCETON, W. VA.—Farris Bridge Co., Pittsburgh, has been awarded the contract for a reinforced concrete bridge over Bluestone river.

EWING, KY.—Limestone Crusher Co. has been incorporated; $1,000 capital stock; by Jacob Stickrod, I. N. Ross, F. B. Moore, C. F. Parker.

ROCKPORT, KY.—Machinery and equipment of the Rockport Saw Mill Co. will be sold at a trustee's sale in bankruptcy shortly; sale will take place at 22 Carew building, Cincinnati.

CENTERVILLE, IND.—Dunbar Mfg. Co., hardware, has been incorporated; $2,200 capital stock; by Oris K., Thomas G. and Bertha J. Dunbar.

INDIANAPOLIS.—Auto Body Co., manufacturer, has been incorporated; $20,000 capital stock; by H. Putnam Wood, J. E. Wood, Roy M. Stuart.

LA PORTE, IND.—Illinois & Indiana Construction Co. has been incorporated; $10,000 capital stock; by Richard C. Canterbury, George H. Boyd, Carl Loetz.

BELLEVILLE, ILL.—Alloy Metals Foundry Co. has increased its capital stock from $2,500 to $5,000.

CARBONDALE, ILL.—Urbauer & Atwood, 106 South Twelfth street, St. Louis, Mo., is low bidder on a power house and plant at the state normal university here; the building is to be one story, brick, 38 x 51 feet, to cost about $40,000 for building and equipment.

CHICAGO.—Victor Mfg. & Gasket Co., 1956 S. Troy avenue, has increased its capital stock from $50,000 to $100,000.

CHICAGO.—Seidel Wheel Co. has been incorporated to manufacture wheels and other vehicle accessories; $50,000 capital stock; by John A. Bode, William B. Bond, Samuel W. Banning, 140 South Dearborn street.

SOUTHERN STATES

CHARLESTON, S. C.—Contract for erecting a building for the General Asbestos Co. has been awarded to the Fesle-Carter Construction Co., Greenville, S. C.

BIRMINGHAM, ALA.—Southern Land Co., through its agents, A. A. Gambill & Co., has purchased a site and is having plans prepared for a $50,000, four-story, steel and concrete building.

SAN ANTONIO, TEX.—Dr. William Polatsik, New York City, is negotiating for property for a $100,000 varnish factory which will be erected in San Antonio.

LITTLE ROCK, ARK. — J. M. Parker, Monroe, La., says the Arkansas, Louisiana & Gulf railroad will start work within six months on extending its terminus at Monticello, Ark., to Pine Bluff, Ark., a distance of 50 miles, at an estimated cost of $1,000,000.

JACKSON, TENN. — Southern Engine & Boiler Works increases capital stock from $300,000 to $400,000.

TULSA, OKLA.—H. L. Pettit, president; and R. B. Bennett, secretary of the Staple Post Mold Co., Westerville, O., are in Tulsa for the purpose of locating a plant here with an output of 2,000 posts a week; it is planned to have the plant in operation within 60 days.

WESTERN STATES

PRATT, KAN.—E. P. Jones, city clerk, will take bids about Feb. 15 for an electric light plant and water works, costing about $50,000.

BILLINGS, MONT.—It is reported the Twohy Brothers Construction Co. will start work shortly on the projected Canyon creek branch for the Northern Pacific Railway Co. into the basin country, about 100 miles.

BUTTE, MONT.—It is reported the Chicago, Milwaukee & St. Paul Railway Co. plans a branch line from the Black hills in South Dakota, along Indian creek into the Little Missouri project in this state for a connection with the coast line at Miles City.

LEWISTOWN, MONT.—Fire chief recommends the purchase of a 4-cylinder combination machine, a 500-gallon pump, etc., to cost in all about $6,000.

BOISE, IDA.—It is reported funds for building the Boise-Winnemucca branch of the Western Pacific have been secured.

BOISE, IDA.—City engineer has submitted an estimate for a lighting system in South Boise at $4,639.30.

DEARY, IDA.—Roy Drury has been granted a franchise for a lighting system.

KINGSTON, IDA.—Hypotheek Mining Co. plans building a mill on Tom Young's ranch.

KALAMA, WASH.—Mountain Timber Co. will rebuild its mill, recently burned, at a cost of about $300,000.

SPOKANE, WASH. — Oregon-Washington Railroad & Navigation Co. has permits for five one-story, brick buildings for a roundhouse, machine shops, etc., here to cost about $82,000.

TACOMA, WASH.—Pierce county commissioners have granted a franchise to the Puget Sound Traction, Light & Power Co. to build a power and light line into the Fife district.

GRANTS PASS, ORE.—Thos. S. Burley, president of the Alameda Mining Co., says $75,000 improvements will be made in the property here, including a 200-ton concentrator.

PORTLAND, ORE.—Colonel McKinstry, corps of engineers, United States army, has been authorized to call for bids on the construction of a stern wheeler to be used as a tender to suction dredge Montecello; it will be 97 feet long, 20 feet beam and 4 feet depth of hold.

LONG BEACH, CAL.—Piru Iron Mining Co. has been incorporated; $10,000 capital stock; by J. R. Pickerill, V. E. Neilson, A. W. Macdonell.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery to April 1.)

Bessemer, valley	$13.75
Bessemer, Pittsburgh	14.70
Basic, Pittsburgh	13.45
Basic, eastern Pa.	13.50
Malleable, Pittsburgh	13.70 to 13.95
Malleable foundry, Chicago	13.00 to 13.50
Malleable foundry, Philadelphia	15.00 to 15.25
Malleable foundry, Buffalo	13.00 to 13.25
No. 1X foundry, Philadelphia	14.50 to 14.75
No. 2 foundry, Pittsburgh	13.95
No. 2 foundry, valley	13.00
No. 2 foundry, Cleveland	13.25 to 13.50
No. 2 foundry, Ironton	12.75 to 13.00
No. 2 foundry, Chicago	13.00 to 13.50
No. 2X foundry, Philadelphia	14.25 to 14.50
No. 2X fdy., N. J. tidewater	14.25 to 14.50
No. 2X foundry, Buffalo	13.00 to 13.25
No. 2 plain, Philadelphia	14.00 to 14.25
No. 2 plain, N. J. tidewater	14.00 to 14.25
No. 2 plain, Buffalo	12.75 to 13.00
No. 2 southern, Birmingham	9.50 to 10.00
No. 2 southern, Cincinnati	12.40 to 12.90
No. 2 southern, Chicago	13.75 to 14.00
No. 2 southern, Phila. delivery	14.00 to 14.50
No. 2 southern, Cleveland	13.50 to 13.75
No. 2 south'n, New York, docks	13.75 to 14.00
No. 2 southern Boston, docks	13.75 to 14.25
No. 2 south'n, interior New Eng.	14.50 to 15.50
No. 2 southern, St. Louis	14.00 to 14.25
Virginia No. 2X furnace	12.50 to 12.75
Virginia 2X, Philadelphia	15.25 to 15.50
Virginia 2X, Jersey City	15.50 to 15.75
Virginia 2X, Boston points	15.75 to 16.00
Gray forge, eastern Pa.	13.25 to 13.50
Gray forge, Pittsburgh	13.45 to 13.70
Gray forge, Birmingham	8.75 to 9.00
Silveries, 8 per cent, Jackson, O.	15.75 to 16.00
Silveries, 5 per cent Birmingham	12.50
Silveries, 5 per cent, Chicago	16.35
Standard low phos., Phil.	19.00 to 20.00
Lebanon low phos., furnace	16.00 to 16.50
Low phos., Pittsburgh	20.95 to 21.20
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	15.75 to 16.75
Charcoal, Birmingham	25.00

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bess., 51½ per cent	3.00
Mesabi non-Bessemer, 51½ per cent	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7c
Foreign non-Bess., 50 to 65 per cent	7c

COKE

(At the ovens)

Connellsville furnace	$1.55 to 1.65
Connellsville fur. contr	1.65 to 1.75
Connellsville foundry	2.00 to 2.40
Connellsville fdy., contr	2.25 to 2.50
Wise county furnace	1.75 to 2.00
Wise county foundry	2.10 to 2.40
Pocahontas furnace	1.75 to 2.00
Pocahontas foundry	2.00 to 2.25
New River, foundry	2.50 to 3.00
New River, furnace	2.00 to 2.25

FERRO-ALLOYS

Ferro-manganese, Baltimore	$68.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Open-hearth billets, Phila.	$21.40 to 21.90
Forging billets, Phila.	24.40 to 25.40
Forging billets, Pbgh.	24.00 to 24.50

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama canal, per 100 lbs., in carload lots, exclusive of insurance and dockage.

From New York	$0.30
From Pittsburgh	.46
From Youngstown	.48
From Niles	.48
From Wheeling	.46
From Steubenville	.46
From Johnstown	.445
From Coatesville	.39
From Steelton	.40
From Bethlehem	.375
From Cleveland	.49
From Chicago	.60

Wire rods, Pittsburgh	$25.00
Billets, Pittsburgh	19.50 to 20.50
Billets, Youngstown	18.50 to 19.50
Sheet bars, Pittsburgh	20.00 to 21.00
Sheet bars, Youngstown	19.00 to 20.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Lgt. rails, 8-lbs., Pbgh. & Chgo.	1.22c
Lgt. rails, 12 lbs., Pbg. & Chgo.	1.17c
Lgt. rails, 16 to 20 lbs., Pgh. & Chgo.	1.12c
Lgt. rails, 25 to 45 lbs., Pbgh. and Chgo.	1.07c
Relaying rails, standard, Pbgh. & Chgo.	$23.00 to 24.00
Relaying rails, light, Chicago	21.50 to 22.50
Angle bars, st. sect, Pbgh. base.	1.50c
Angle bars, st. sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.35c to 1.40c
Spikes, railroad, Chgo.	1.50c
Track bolts, Pbgh.	1.85c
Track bolts, Chgo.	2.00c

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—	
Cleveland	$0.95
Newark, N. J.	2.85
New England	2.85
Philadelphia	2.65
Pittsburgh	.95
St. Louis	3.18
Buffalo to:—	
Albany, N. Y.	$1.20
New England (all rail)	2.45
New York and Brooklyn (all rail)	2.45
New York and Brooklyn (by canal)	1.00 to 1.50
Virginia furnaces to:—	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:—	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
New York (all rail)	6.15
New York (rail and water)	4.25
Philadelphia (all rail)	5.20
Philadelphia (rail and water)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
Chicago to:—	
Des Moines	$2.80
Milwaukee	.50
Moline, Ill.	1.47
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:—	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.10c
Structural shapes, Chicago	1.29c
Structural shapes, Philadelphia	1.25c to 1.30c
Structural shapes, New York	1.26c to 1.31c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.25c to 1.29c
Tank plates, Pittsburgh	1.10c
Tank plates, Philadelphia	1.25c to 1.30c
Tank plates, New York	1.26c to 1.31c
Bars, soft steel, Pittsburgh	1.10c
Bars, soft steel, Chicago	1.29c
Bars, soft steel, Philadelphia	1.25c to 1.30c
Bars, soft steel, New York	1.26c to 1.31c
Hoops, carloads, Pittsburgh	1.25c
Hoops, less carloads, Pittsburgh	1.30c
Bands, Pittsburgh	1.10c
Shafting, carloads, Pbgh., disc. contract	67 to 68
Shafting, less carl'ds, Pgh., disc.	63
Bar iron, Chicago	1.00c to 1.05c
Bar iron, Philadelphia	1.12c to 1.22c
Bar iron, New York	1.10c to 1.15c
Bar iron, Cleveland	1.15c
Bar iron, Pittsburgh	1.10c to 1.15c
Hard steel bars, Chicago	1.20c to 1.25c
Smooth finish, mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.80c
No. 28, black, Chicago	1.99c to 2.04c
No. 28, tin mill, black, Pbgh.	1.85c
No. 28, galvanized, Pbgh., nom.	2.90c to 3.00c
No. 28, galvanized, Chgo. (nom.)	3.09c to 3.19c
No. 10, blue, annealed, Pbgh.	1.30c to 1.35c
No. 10, blue, annealed, Phila.	1.50c to 1.55c
Tin plate, 100 lb., coke base	$3.10 to 3.20

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll., and re-anl.	30 cents
Hot roll'd, pickl'd and anl., tin mill	25 cents
Full pickl'd, cold rolled and re-anl.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller levelling	10 cents
Patent levelling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxidizing	10 cents
Lime finish	10 cents
Open-hearth stamping steel, free from mill scale	55 cents
Special open-hearth deep stpg. steel free from mill scale	80 cents
Extra deep special auto body stock	$1.25
Ext. for 28 gage ov. 32 to 36-in. wide	10 cents

No reduction for sheets not annealed.

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv. Butt-weld.
Steel, ¾ to 3 inches	81	72½
Iron, ¾ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	80	71½

BOILER TUBES

Steel, 3½ to 4½ inches	74
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.55
Wire nails, retailers, Pittsburgh	1.60
Plain wire, jobbers, Pittsburgh	1.35
Plain wire retailers, Pittsburgh	1.40
Galvanized wire, jobbers, Pbgh.	1.75
Galvanized wire, retailers, Pbgh.	1.80
Polished staples, Pbgh.	1.55
Galvanized staples, Pbgh.	1.95
Barb wire, painted, jobbers, Pbgh.	1.55
Barb wire, painted, retailers, Pbgh.	1.60
Barb wire, galv., retailers, Pbgh.	2.00
Barb wire, galv., jobbers, Pbgh.	1.95

IRON AND STEEL PRICES

Corrected up to Tuesday noon

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ½ x 6 inches, smaller or shorter, rolled threads, 80 and 20; cut threads 80 and 15; larger or longer, 75 and 15.

Machine bolts with hot pressed nuts ½ x 4 inches, smaller or shorter, rolled, 80 and 25; cut, 80 and 20; larger or longer, 80.

Gimlet and cone point lag or coach screws, 85 and 5.

Hot pressed square, blank or tapped nuts, $6.50 off list; hot pressed hexagon blank or tapped, $7.40 off.

Cold pressed, square, blank or tapped, $6.20 off; hexagon, blank or tapped, ½ inch and larger, $7.50; ⅞-inch and smaller, $8.00.

RIVETS

Structural rivets, Pbgh	1.45c to 1.50c
Structural rivets, Chgo	1.68c
Boiler irvets, Pbgh	1.55c to 1.60c
Boiler rivets, Chgo	1.78c

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

COLD ROLLED STRIP STEEL

(Subject to regular extras.)

0.10 to 0.19 Carbon.	Base price Cut to length Hard.	Soft.
1½ inch and wider	2.85	3.10
0.100 and thicker	2.95	3.20
0.050 to 0.099 inc.	3.10	3.35
0.035 to 0.049 inc.	3.35	3.75
0.031 to 0.034 inc.	3.60	4.00
0.025 to 0.030 inc.	3.80	4.20
0.020 to 0.024 inc.	4.70	5.20
0.017 to 0.019 inc.	5.10	5.60
0.015 and 0.016	5.95	6.45
0.013 and 0.014	6.55	7.05
0.012	6.90	7.40
0.011	7.25	7.75
0.010	Coils.	
0.100 and thicker	2.75	3.00
0.050 to 0.099 inc.	2.80	3.05
0.035 to 0.049 inc.	2.95	3.20
0.031 to 0.034 inc.	3.10	3.50
0.025 to 0.030 inc.	3.20	3.60
0.020 to 0.024 inc.	3.30	3.70
0.017 to 0.019 inc.	3.60	4.10
0.015 and 0.016	4.00	4.50
0.013 and 0.014	4.70	5.20
0.012	5.05	5.55
0.011	5.40	5.90
0.010	5.75	6.25

CAST IRON WATER PIPE

Three to 20 in., Cleveland	$21.50
Twenty-four to 48-in., Cleveland	21.00
Four-inch, Chicago	26.00
Six to 12 inches, Chicago	24.00
Large sizes, Chicago	23.00
Six-inch, New York	20.00 to 20.50
Four-inch, Birmingham	19.50
Six-inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.80c
Steel bars, Philadelphia	1.65c to 1.70c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.60c to 1.70c
Iron bars, Philadelphia	1.60c to 1.65c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.85c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia	1.65c to 1.70c
Shapes and plates, New York	1.85c
No. 10 blue anl. sheets, Chgo	1.95c
No. 10 blue anl. sheets, Cleve.	2.05c
No. 10 blue anl. sh., St. Louis	2.00c
No. 10 blue anl. sheets, Cinci	1.95c
No. 28 black sheets, Chgo	2.55c
No. 28 black sheets, Cleveland	2.45c
No. 28 black sheets, Cincinnati	2.45c to 2.55c
No. 28 black sheets, St. Louis	2.55c
No. 28 galv. sheets, Chgo	3.55c
No. 28 galv. sheets, Cleveland	3.50c
No. 28 galv. sheets, Cincinnati	3.40c to 3.55c
No. 28 galv. sheets, St. Louis	3.55c

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo	$ 8.75 to 9.00
No. 1 railroad wrought, Cleve.	9.25 to 9.75
No. 1 railroad wrought, St. L.	7.50 to 7.75
No. 1 railroad wrought, Cincin.	8.00 to 8.50
No. 2 railroad wrought, Chgo	8.25 to 8.50
No. 2 railroad wrought, St. L.	7.50 to 8.00
Arch bars and transoms, Chgo.	11.75 to 12.25
Arch bars and transoms, St. L.	11.00 to 11.50
Knuckles, coup. & spr'gs, Chgo.	8.75 to 9.00
Knuckles, coup. & spr'gs, St. L.	9.00 to 9.50
Iron car axles	14.75 to 15.25
Shafting, Chicago	11.75 to 12.25
Shafting, St. Louis	11.00 to 11.50
Steel car axles, Chicago	11.25 to 11.75
Steel car axles, St. Louis	11.00 to 11.50
Locomotive tires, Chicago	9.00 to 9.50
Locomotive tires, St. Louis	8.50 to 9.00
Cut forge, Chicago	8.25 to 8.50
Pipes and flues, Chicago	7.00 to 7.25
Pipes and flues, Cleveland	7.25 to 7.50

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 lbs. to:—	
New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11.6 cents
Baltimore	14½ cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Minneapolis and St. Paul	32.9 cents
Denver	68.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, (all rail)	80 cents
Pacific coast, via Panama canal	46 cents

Pipes and flues, St. Louis	5.75 to 6.25
No. 1 cast, Chicago	9.00 to 9.25
No. 1 cast, Cleveland	10.00 to 10.50
No. 1 cast, Cincinnati	8.50 to 9.00
No. 1 cast, St. Louis	9.00 to 9.25
No. 1 busheling, Chicago	8.00 to 8.25
No. 1 busheling, Cleveland	8.25 to 8.50
No. 1 busheling, Cincinnati	5.75 to 6.25
No. 1 busheling, St. Louis	7.50 to 7.75
No. 2 busheling, Chicago	7.75 to 8.00
No. 1 boiler plate, cut, Chgo	5.50 to 5.75
No. 1 boiler plate, cut Buffalo	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	5.50 to 5.75
Boiler punchings, Chicago	8.25 to 8.75
Cast borings, Chicago	5.00 to 5.50
Cast borings, Cleveland	6.00 to 6.25
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	4.50 to 4.75
Machine shop turnings, Chicago	5.25 to 5.50
Machine shop turnings, Cleve.	5.50 to 6.00
Machine shop turnings, Cinci	$ 4.25 to 4.75
Machine shop turnings, St. L.	5.00 to 5.50
Malleable agl., Chicago	7.50 to 7.75
Malleable agricultural, St. Louis	6.50 to 7.00
Malleable, railroad, Chicago	7.75 to 8.25
Malleable, railroad, Cincinnati	7.00
Malleable, railroad, St. Louis	7.00 to 7.50
Angle bars, iron, Chicago	11.25 to 11.75
Angle bars, iron, St. Louis	10.00 to 10.50
Angle bars, steel, Chgo	8.00 to 8.25
Angle bars, steel, St. Louis	8.50 to 8.75
Stove plate, Chicago	8.25 to 8.50
Stove plate, Cleveland	7.50
Stove plate, Buffalo	9.00 to 9.75
Stove plate, Cincinnati	6.50 to 7.00
Stove plate, St. Louis	7.25 to 7.50
Bundled sheet, Cincinnati	4.00 to 4.50

(Gross tons.)

Heavy melting steel, Pbgh	$11.50 to 11.75
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chgo	9.00 to 9.50
Heavy melting steel, Cleveland	9.75 to 10.00
Heavy melting steel, Cincinnati	9.00 to 9.50
Heavy melting steel, eastern Pa.	10.00 to 10.50
Heavy melting steel, New York	8.50 to 9.15
Heavy melting steel, St. Louis	9.75 to 10.25
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.00 to 9.25
Grate bars, New York	6.50 to 7.00
No. 1 railroad wrought, east. Pa.	11.50 to 12.00
No. 1 railroad wrought, Pbgh	10.25 to 10.75
No. 1 R. R. wght., New York	9.50 to 10.00
No. 1 R. R. wrought, Buffalo	10.00 to 10.50
Shafting, New York	11.50 to 12.00
Shafting, eastern Pa.	13.50 to 14.00
Wrought pipe, New York	7.50 to 8.00
Wrought pipe, eastern Pa.	9.75 to 10.25
Mch. shop turnings, New York	5.50 to 6.00
Machine shop turnings, Buffalo	5.50 to 6.00
Mch. shop turnings, Pbgh	7.75 to 8.00
Mch. shop turnings, eastern Pa.	7.75 to 8.25
Cast borings, New York	5.50 to 6.00
Cast borings, eastern Pa.	7.75 to 8.25
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.00 to 8.25
Stove plate, N. J. points	8.00 to 8.50
Stove plate, Pittsburgh	8.50 to 9.00
Stove plate, eastern Pa.	8.50 to 9.00
Shoveling steel, Chicago	8.25 to 8.75
Shoveling steel, St. Louis	8.00 to 8.50
Reroll'g rails, 5 ft. & ov., Pbgh.	11.50 to 12.00
Reroll. rails, 5 ft. & ov., Chgo	9.50 to 9.75
Reroll. rails, 5 ft. & ov., Cleve.	11.00 to 11.50
Reroll. rails, 5 ft. & ov., E. Pa.	10.50 to 11.00
Reroll. rails, 5 ft. & ov., St. L.	10.75 to 11.25
Steel rails, short, Chicago	9.50 to 10.00
Steel rails, short, Cleveland	11.00 to 11.50
Steel rails, short, St. Louis	10.25 to 10.50
Iron rails, Cleveland nom.	11.75 to 12.00
Iron rails, Chgo	12.00 to 12.50
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, eastern Pa.	13.50 to 14.00
Iron rails, St. Louis	10.50 to 11.00
Iron rails, Pittsburgh	13.00 to 13.50
Frogs, switches, guards, Chgo	9.00 to 9.25
Frogs, switches & g'rds, St. L.	9.75 to 10.25
Car wheels, (iron), Pittsburgh	10.50 to 11.00
Car wheels, (steel), Pittsburgh	11.50 to 12.00
Car wheels, Chicago	10.00 to 10.50
Car wheels, eastern Pa.	10.50 to 11.00
Car wheels, Buffalo	10.50 to 11.00
Car wheels, N. J. points	9.25 to 9.50
Car wheels, St. Louis	10.50 to 11.00
Iron axles, Pittsburgh	18.00 to 18.50
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	18.50 to 19.00
Iron axles, Buffalo	19.00 to 19.50
Iron axles, Chicago	15.50 to 16.00
Steel car axles, New York	11.50 to 12.00
Steel car axles, Buffalo	12.00 to 12.50
Steel car axles, Cleveland	12.50 to 13.00
Steel car axles, eastern Pa.	13.50 to 14.00
No. 1 busheling, Buffalo	8.25 to 8.75
No. 1 busheling, Pittsburgh	9.75
No. 2 busheling, Buffalo	5.75 to 6.25
Low phosphorus steel, Buffalo	14.00 to 14.50
Low phosphorus steel, Pbgh	13.00 to 13.25
Low phos. steel, eastern Pa.	13.50 to 14.00
No. 1 forge, eastern Pa.	7.75 to 8.25
No. 1 cast, eastern Pa.	11.75 to 12.25
No. 1 cast, Pittsburgh	11.25 to 11.75
No. 1 heavy cast N. J. points	11.00 to 11.50
Mall. iron, R. R., Cleveland	9.25 to 9.75
Malleable railroad, Pittsburgh	9.75 to 10.00
Malleable, R. R., Buffalo	9.25 to 9.75
Malleable, R. R., east Pa.	8.00 to 8.50
Bundled sheet, Pittsburgh	9.00 to 9.50
Bundled sheet, Cleveland	7.50

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For Repair Purposes at Gary

(*Continued from page* 281.)

lathe for necking. The latter was built at the Gary works and has a special gearing designed to do heavier work than the other lathes. There also is a 40 x 172-inch roll grinder.

In the pattern and carpenter shops are full equipment for working in wood.

To facilitate imperative repairs about the blast furnaces, as mentioned above, a shop is provided, equipped with a 44-inch drill press, a 30-inch gear engine lathe, a 16-inch shaper and a 1½-inch emery grinder.

Tungsten Ores in 1914

The production of tungsten ores in the United States during 1914 is estimated as equivalent to about 990 short tons, carrying 60 per cent of tungsten trioxide (WO_3), according to preliminary figures collected by Frank L. Hess, of the United States geological survey, which are thought to be accurate within 5 per cent. This output is the smallest since 1908, when only 671 tons was produced. In 1913 the production was 1,537 tons, of which 953 tons was ferberite from the Boulder field in Colorado, a quantity almost equal to that of the whole country in 1914, but the production of the Boulder field in 1914 was only 466 tons.

Prices ranged from $6.50 to $9 a "unit" (that is, so much a short ton for each per cent of tungsten trioxide), depending on the quality and quantity of the ore and the urgency of the buyers' and sellers' needs.

Of the various tungsten minerals, the one produced in largest quantity was scheelite, from the Atolia district, in the Mohave desert, California. A little scheelite was also mined in the Deep Creek mountains, Utah. Small quantities of both wolframite and hubnerite were shipped from Arizona, and hubnerite was produced on Patterson Creek, in the Blue Wing district, Idaho. Some wolframite was produced near Penasco, N. M., and in the Clark mountain district, near Ivanpah, Cal.

The more easily mined tungsten ores which lie close to the surface are now largely worked out in the older districts, and mining is thus becoming more difficult and expensive; this is especially hard on the small operator.

The European war disturbed tungsten mining, as it did most other lines of business, and has had much to do with the reduced output, but the imports of ore, tungsten and ferro-tungsten, as shown by figures collected by the bureau of foreign and domestic commerce, have been affected even more. During the year 267 tons of ore, valued at $139,697, were imported, against 401 tons, valued at $213,122, in 1913. During 1913 661 tons of tungsten metal and ferro-tungsten, valued at $835,212, were imported. In 1914 these imports dropped to 192 tons, valued at $219,506.

Metal Mine Fatalities

Progress of the safety first movement is indicated by the report issued recently by the bureau of mines on the number of deaths in the metal mines during 1913. Of the 193,088 men employed, 683 were killed, a death rate of 3.54 per 1,000 employed. This compares with a death rate of 3.91 for 1912 and 4.19 for 1911. The bureau says that, if the 1911 death rate had prevailed in 1913, the number killed would have been 809. This means a saving of 126 lives.

"A number of the states show a slight increase in the death rates, but a majority of the principal mining states

show marked decreases," says Albert H. Fay, the bureau engineer who compiled the statistics. "The important mining states showing a continuous reduction of fatality rates during 1911, 1912 and 1913 are Idaho, Michigan, Montana, Nevada, New Jersey, South Dakota and Utah, representing, in 1913, 38 per cent of the mining industry.

"This gradual reduction is to be accounted for largely by the introduction of safety appliances, better supervision and a more strict enforcement of rules and regulations of the mining companies, and a closer observance of the state laws. Practically all of the larger companies, and many of the smaller ones, have done much in safeguarding their employes. They have inaugurated the 'safety first' movement with the results I have just mentioned. By first-aid treatment many slight injuries have been cared for, pain relieved, and a cure effected in a short time, so that many of these injuries have been of short duration, and kept out of the 'serious injury' or 'fatality' class."

In the matter of fatalities, Arizona leads the list with 86; Michigan follows with 82; Montana, 64; Minnesota, 63; California, 52; Colorado, 44; Utah, 36; Missouri, 34; New Mexico, 28; Nevada, 25; Alaska, 25; Idaho, 24, and Alabama, 22.

Portland Cement Production

The Portland cement manufactured in the United States in 1914 approximated 88,514,000 barrels, compared with 92,097,131 barrels in 1913, a decrease of about 3,583,000 barrels, or nearly 4 per cent. These preliminary figures are given out by the United States geological survey and are based on returns received by E. F. Burchard from all the operating mills in the United States except one, for which an estimate has been made. The estimated shipments of Portland cement during 1914 were 86,715,000 barrels, compared with 88,689,377 barrels in 1913, a decrease of about 1,975,000 barrels, or 2.2 per cent. On account of the surplus of production over shipments stocks of cement at the mills apparently increased more than 14 per cent, or from 11,220,328 barrels in 1913 to 12,818,000 barrels at the close of 1914. The estimates furnished by some producers undoubtedly included more or less underground clinker, but it is believed that the figures for production and shipments, if not for stocks, are close to those that will be shown later by exact reports from the producers.

The Lehigh district of eastern Pennsylvania and western New Jersey produces more cement than any other section of the United States—about 28 per cent of the total production. This district showed a decrease of more than 9 per cent in both production and shipments of Portland cement. The Illinois and northwestern Indiana district, which is next in importance, with an annual output of more than 11,000,000 barrels, showed a slight decrease, and the Pacific coast district (California and Washington), which is third in importance and produces about 8,000,000 barrels, showed a decrease of about 12 per cent. Important increases in production and shipments were shown by New York state, the Michigan-northeastern Indiana district, the Iowa-Missouri district, the Maryland-Virginia-West Virginia district, and the Rocky mountain district. The average value per barrel was probably slightly lower than in 1913.

A number of modernizing improvements have been ordered made upon the second of the Colebrook furnaces of the Lackawanna Iron & Steel Co., Lebanon, Pa. These improvements are to be a duplicate of those completed several months ago on the first Colebrook stack and consist chiefly of the re-equipping of the furnaces with better filling and storage facilities.

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St. Louis, Mo., Representative: Heimbuecher Metal Products Co., 514 N. 3d St.

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Men Wanted Minimum, 50 words, $1.00. Each additional word, 2c. All capitals, 50 words, $1.50. Each additional word, 3c.

Position Wanted Minimum, 25 words, 50c. Each additional word, 2c. All capitals, 25 words, 75c. Each additional word, 3c.

Miscellaneous Classified Minimum, 25 words, $1.00. Each additional word, 4c. All capitals, 25 words, $2.00. Each additional word, 8c.

Remittance should be made to cover eight (8) words for address if box number is used.

Men Wanted

UNDERSIGNED COUNSEL WILL CONFIDENTIALLY negotiate preliminaries for important executive, technical, administrative and professional positions, insuring strictest privacy. Not an agency, but a highly-endorsed, high grade method of negotiating preliminaries only, for $3,000 to $12,000 men. Send address only for explanation. R. W. Bixby, Lock Box 134-E9, Buffalo, N. Y.

PRACTICAL MAN, WITH EXECUTIVE ability, to systematize gear manufacturing plant. Permanent employment if satisfactory. Address Box 312, THE IRON TRADE REVIEW, Cleveland, O.

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WANTED: — A PATTERN FOREMAN. State age, experience and reference. Address P. O. Box 38, Cleveland, O.

AMERICAN SERVICE COMPANY, General Engineering Agency, Pittsburgh, Pa., requires confidential applications from experienced manufacturing men for private proposals to employing authorities. Best service—correspondence invited.

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WANTED: — POSITION AS SUPERINTENDENT or foreman by a thoroughly practical and capable man of 20 years experience in erecting iron stairways, railings, store fronts and general ornamental iron work. Address Box 108, THE IRON TRADE REVIEW, Cleveland, O.

EXPERIENCED PATTERN MAKER wishes position as foreman; over 10 years in charge of shops employing from 20 to 100 men making patterns for gas and oil engines and electrical machinery. Broad experience with molding machines. Address Box 253, THE IRON TRADE REVIEW, Cleveland, O.

GENERAL SUPERINTENDENT OF blast furnace and coke oven plant, 1,000,000 tons pig iron capacity, and manager of fabricating shop, 60,000 tons capacity, good organizer of men and efficiency methods, low cost records, 20 years' practical experience in designing, erecting and operating desires to connect with firm on salary and bonus basis. Best of references. Address Box 257, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY FIRST CLASS master mechanic familiar with rolling mill, blast furnace and steel plant work; have more than twelve years' experience in charge of the above lines of work and am thoroughly familiar with it and the management of help; open for engagement to take charge Jan. 1, 1915; best references. Address Box 261, THE IRON TRADE REVIEW, Cleveland, O.

CHEMIST (GRADUATE), TWO YEARS' experience in iron and steel laboratory, wants position as assistant or take charge of small laboratory. Address Box 288, THE IRON TRADE REVIEW, Cleveland, O.

SKELP ROLLER, 17 YEARS' EXPERIENCE; first class mechanic; careful worker; best references; inventive ability; also knows proper drafting of rolls; desires position with good firm. Correspondence solicited. Address Box 298, THE IRON TRADE REVIEW, Cleveland, O.

QUALITY SHEET STEEL REQUIRES special knowledge. Metallurgist desires position where operating experience in producing finest grades of sheets will be valuable; references. Address Box 302, THE IRON TRADE REVIEW, Cleveland, O.

SUPERINTENDENT OF FOUNDRY manufacturing chilled iron car wheels; 32 years of age, married, temperate; 16 years practical experience, seven years an executive; mix by analysis, expert on cupola practice; good executive and organizer; at present employed; best of references concerning character and ability. Address Box 307, THE IRON TRADE REVIEW, Cleveland, O.

MASTER MECHANIC OR MACHINE shop foreman wants position; 29; married; technical education; 12 years' experience rolling mills and blast furnaces; best references. Address Box 313, THE IRON TRADE REVIEW, Cleveland, O.

EXPERIENCED TECHNICAL PUBLICITY AND EXPORT MAN, 10 YEARS' EXPERIENCE, KNOWLEDGE OF SPANISH LANGUAGE AND SOUTH AMERICAN TRADE, DESIRES WORK WHERE ABILITY WILL BE PROPERLY REWARDED. ADDRESS BOX 320, THE IRON TRADE REVIEW, CLEVELAND, O.

SUPERINTENDENT OR MASTER MECHANIC with general all-around machine, foundry, boiler, blast furnace, contract and jobbing work experience; technical education, expert cost reducer and organizer; a high grade man who is a hustler and gets results. Address Box 323, THE IRON TRADE REVIEW, Cleveland, O.

WHEN YOU NEED A HIGH GRADE executive, engineer, draftsman or any technical man, consult The Engineering Agency, Inc., (Est. 21 years) 1662 Monadnock Block, Chicago.

WANTED:—POSITION AS ASSISTANT superintendent of steel works; six years' technical training in engineering and metallurgy, 12 years' practical experience; experienced in the management of steel furnaces, forges and rolling mills; best references. Address Box 324, THE IRON TRADE REVIEW, Cleveland, O.

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YOUNG MAN DESIRES POSITION AS purchasing agent, cost accountant, book-keeper or organizer in manufacturing plant; 12 years' experience large manufacturing plants. Address Box 327, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED AS PURCHASING agent; man 28; experienced; at present employed with large manufacturing corporation. Address Box 328, THE IRON TRADE REVIEW, Cleveland, O.

YOUNG MAN, (29), TECHNICAL TRAINing, former assistant M. M. of large steel mill, open for engagement. Address Box 25, THE IRON TRADE REVIEW, 90 West St., New York City.

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STEEL FOUNDRY FOREMAN, 15 years' experience in open hearth, converter and manganese steel castings, both green and dry sand. Address Box 333, THE IRON TRADE REVIEW, Cleveland, O.

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Opportunities

FOR SALE:—OWING TO THE DEATH of the president and manager of the company, we are offering our complete line of drawings, patterns, jigs and templets covering a line of small gasoline engines, hundreds in use, manufactured stock, manufacturing equipment and several live contracts covering the capacity of the plant for a long period, at a very reasonable figure. Special terms to responsible parties. Address Box 331, THE IRON TRADE REVIEW, Cleveland, O.

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